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ERRATA CORRIGE

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On page 215, Table 4, column 1, last entry, please read as follows:

OFFICES OF FOREIGN BANKS IN NEW YORK

Agencies		Representative Offices
. . . . .	. . . . .	. . . . .
Banco di Napoli	Italy	Banca Nazionale del Lavoro Credito Italiano Banca Commerciale Italiana Banco di Roma Banco di Sicilia

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The Return to Convertibility:
1926-1931 and 1958 - ?
or
Convertibility and the Morning After

> " The study of history, while it does not endow with prophecy, may indicate lines of probability ".
>
> *The Short Reign of Pippin IV*
> by JOHN STEINBECK

Introduction

The " dash to convertibility ", originally envisaged for 1953, finally materialized, as suddenly as belatedly, during the 1958 Christmas weekend. A few days later, the six countries of the European Economic Community were taking the first step on the long road toward full integration of their national economies.

These two events were not unrelated. The British convertibility decision was admittedly hastened to coincide with the French currency reform, and the latter was in turn designed to enable the French to implement their liberalization commitments under the European Economic Community Treaty. Ten other countries followed suit in very short order, thus bringing into force the 1955 European Monetary Agreement and the liquidation of the 1950 European Payments Union.

This cascade of convergent national decisions was widely acclaimed as a new and spectacular demonstration of continued European cooperation in the monetary and economic fields. It unfortunately could also be interpreted in part as an accidental by-product of the deadlock reached, ten days earlier, in the long drawn out negotiation of a Free Trade Area Treaty among all seventeen of the OEEC countries. Vague threats of retaliation against the Six had been brandished by some of the other countries during the hard bargaining of the previous months, if some measure of agreement were not reached by the fateful date of January 1, 1959.

The break-up of the European Payments Union might be a necessary preface to independent national action in the monetary sphere, even though member countries would still be tied in that event — but in a much looser fashion — by their 1955 commitment to link the liquidation of the Union to the simultaneous entry into force of the European Monetary Agreement.

This loosening of European cooperation is all the more disquieting when viewed against the background of the previous return to convertibility after World War I. The new gold standard functioned rather fitfully during the second half of the 1920's, only to be swept away in 1931 by the first gushes of the world depression. Its collapse was blamed by later writers on the incomplete nature of the 1920's so-called " restoration ". The façade of the pre-1914 building had been rebuilt and repainted, but its shattered foundations and crumbling inner walls had received only the most patchwork type of repairs (1).

This criticism held a great deal of truth, but it did not reach far enough and pointed to the wrong conclusion. The words " restoration " and " reconstruction " suggest a mere digging up and dusting off of past institutional forms, regardless of the changes in the economic and political environment in which they have to operate. The nineteenth century monetary standard had been, on the contrary, a highly flexible and adaptable system, whose 1913 version bore little resemblance to the 1816 model. Further evolution and adaptations, rather than a mere return to the past, would have been required to fit it to the needs and conditions of the postwar world.

What was true then is even truer today. The enormous upheavals in economic philosophy, institutions and policies brought about by two world wars and the 1930's world depression have modified radically the conditions under which international convertibility can be meaningfully defined and realistically made to work today. The negative implications of this statement are only too well perceived by the 1958 planners, just as they were by their forefathers in the 1920's. The reservations and qualifications surrounding the new convertibility decisions (2) make it abundantly clear that no

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(1) See particularly W. A. Brown, Jr., *The International Gold Standard Reinterpreted, 1914-1934*, New York, 1940.

(2) The new convertibility obviously will not, any more than it did in the 1920's, reintroduce internationally acceptable gold coins into the national monetary circulation of the

country is prepared to subordinate fully and unilaterally its domestic policy aims and techniques to the maintenance of international balance, and to renounce all recourse to exchange rate adaptations and trade and exchange controls as alternative techniques of balance of payments adjustment.

What is much less clear is the positive content of this " convertibility à la 1959 " and the concrete steps that may preserve it from another collapse " à la 1931 ", when the international economic climate changes once more from good to fair, or from fair to foul.

Two closely interrelated questions seem to me of particular urgency at this time. The first is that of preserving — or restoring — an adequate level of international reserves and liquidity in an expanding world economy, a topic which received a great deal of constructive attention at the recent meeting of the Board of Governors of the International Monetary Fund in New Delhi. It quickly leads, however, into a second and broader issue, on which complete silence was paradoxically, but tactfully, maintained at that meeting, *i.e.* the vulnerability of a world monetary system whose operation becomes increasingly dependent on one or a few *national* currencies as major components of *international* monetary reserves (3).

The same two problems were causing widespread concern in the late 1920's and early 1930's. The Gold Delegation of the Financial Committee of the League of Nations was kept busy for nearly three years, discussing the measures needed to economize gold in short supply and to palliate the most obvious defects of the gold exchange standard (4). Academic economists were equally stirred by these problems and, while disagreeing as always on

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convertible countries. It will, even more than it did then, depend very largely on foreign exchange holdings to supplement inadequate levels of gold reserves throughout the world. It will now apply to non-residents, but not necessarily to residents, to current account transactions, but not necessarily to capital movements.

(3) This silence eloquently refutes any hopes that I might have otherwise entertained of having stimulated the interest of the Fund in these problems through my exhortations in *Europe and the Money Muddle* (Yale University Press, June 1957, pp. 295-301).

(4) See these various publications of the League of Nations:

a. *Interim Report of the Gold Delegation of the Financial Committee*, 1930.

b. *Selected Documents submitted to the Gold Delegation of the Financial Committee*, 1930.

c. *Second Interim Report of the Gold Delegation of the Financial Committee*, 1931.

d. *Selected Documents on the Distribution of Gold submitted to the Gold Delegation of the Financial Committee*, 1931.

e. Dr. Feliks Mlynarski, *The Functioning of the Gold Standard*, 1931.

f. *Report of the Gold Delegation of the Financial Committee*, 1932.

technical details and proposed remedies, showed a rare unanimity in their criticism of the latter system. The wisdom of these warnings was, for once, promptly confirmed by the collapse of sterling in September 1931, the wholesale liquidation of the gold exchange standard, and the ensuing aggravation of the world crisis through the spiralling of exchange rate devaluations and of trade and exchange restrictions. In view of this sad experience, the complacency with which we are now returning to the same unorganized gold exchange standard, on an even shakier basis than in the 1920's, is hard indeed to understand. This may be what the Managing Director of the International Monetary Fund, Per Jacobsson, had in mind when he reiterated in several of his recent speeches his favorite warning from Santayana: "Those who do not remember the past will be condemned to repeat it".

The present article will focus primarily on these major threats to the success of the new convertibility experiment. A second article will then try to define, on the basis of this analysis, some of the reforms that might help adapt present-day convertibility institutions to present-day needs and possibilities.

I. Convertibility: What and How?

Convertibility Yesterday.

The original meaning of the word "convertibility" has been all but forgotten in the discussions of the last ten years. It was indeed closely allied to institutional monetary and banking mechanisms totally alien to those of our days, and one of the main characteristics of which was a large and material overlapping between the national money of each country and that of its major trading partners. Outside of small amounts of subsidiary coinage, the greater part of most countries' legal tender money was in the form of gold and silver coins which would either be accepted at par — or very close to par — by the residents of other countries, or be exchangeable at the Mint for any other foreign moneys needed in international settlements (5). The convertibility problem

(5) The ratio of gold and silver coinage to total monetary circulation, for the world at large, is estimated to have fluctuated between, roughly, 70 and 80 per cent between 1885 and 1913. See the interesting volume of Jacques E. Mertens on *La Naissance et le Développement de l'Etalon-Or*, Presses Universitaires de France, Paris, 1944, Tables 49-53.

was, to that extent, by-passed through the material equivalence of the various national currencies in terms of their gold or silver content. The gradual shift from bi-metallism to a pure gold standard progressively limited the role of silver in this respect, but was accompanied by a parallel shift from silver to gold as the major component of national monetary circulation in all the gold standard countries (6).

The development of bank money, in the form of currency notes and demand deposits, did not at first create any specific convertibility problem. Banks were merely subject to the general obligation of discharging their own debts in legal tender money, *i.e.* initially in the gold or silver moneys of the country where they operated. If an individual bank failed to do so, bankruptcy laws would apply to it just as they would to any other individual or firm. Its own creditors would suffer thereby, but the national currency was left unaffected.

Special " convertibility " provisions had to be enacted, however, in connection with the issue of currency notes when these were granted " legal tender " status by the State. Any debtor could then discharge its obligation to its creditors by tendering such currency notes in payment, but the issuing institution itself could not claim the benefit of this provision with respect to its own I.O.U.'s It remained obliged to redeem or " convert " them upon demand in gold (or silver) coins as defined in the country's monetary legislation.

As long as convertibility was in effect in a gold standard country, it would ensure exchange rate stability with respect to all other gold standard countries. The difficulties which might arise in connection with the maintenance of convertibility, however, were not necessarily related to balance of payments deficits. They might originate as well in an increased demand for internally circulating gold coins, as might occur during a period of boom in domestic economic activity, regardless of the status of the country's balance of payments with the outside world.

A currency became " inconvertible " *de facto* or *de jure* when the issuing institution actually ceased to honor its redemption commitment, or was relieved of it by law. This did not mean, however, that currency holders would thereby be unable to convert it into gold or foreign currencies. They could usually continue to

(6) See Tables quoted in the preceding footnote.

do so, but through the private market and at the rates resulting from supply and demand on that market. The original meaning of the term " inconvertibility " thus had nothing to do with true inconvertibility, in the modern sense of the world. It would be called today " exchange rate flexibility ".

Convertibility Today.

This radical change in the use of the term convertibility is eloquently illustrated by the proposal, so often voiced in recent official and academic discussions, to restore convertibility on the basis of flexible exchange rates, *i.e.* on the basis of what was still in the 1920's the very essence of " inconvertibility ". The explanation of this paradox lies in the fact that several features of the nineteenth century international trade and payments system, more essential than exchange rate stability itself, were then taken for granted, but can no longer be taken for granted today.

The first of these was the freedom accorded to international capital movements. Most modern writers, impressed by the disequilibrating character of " hot money " movements since World War I, would regard such freedom as unessential or even undesirable today. This view was officially sanctioned by the Articles of Agreement of the International Monetary Fund which specifically authorize restrictions on capital movements and even make them, at times, a prerequisite for a country's access to the Fund's resources (7). The discussion which follows will make clear some of my reasons for doubting the practical wisdom of such an approach, and for retaining the freedom of capital movements as one of the basic characteristics of a workable system of international convertibility.

Convertibility is usually identified today with the elimination of all quantitative restrictions on trade and payments on current accounts. This is both too much and too little, too exacting and not sufficiently exacting.

It is not enough, because it leaves out of account tariff restrictions which may, if sufficiently high, unstable, or discriminatory, be even more damaging to international trade than modest, stable and non-discriminatory systems of quantitative restrictions. It is too much, because it makes no distinction between restrictions of

(7) See Article VI, particularly Sections 1 and 3.

this character and the widespread recourse to bilateral trade and payments techniques which may, but do not necessarily, accompany the use of trade and exchange controls in practice (8).

A meaningful definition of convertibility objectives must, of necessity, encompass all alternative techniques through which similar results may be achieved in practice. It must therefore take into account trade as well as exchange techniques of restrictions, and tariff restrictions as well as quantitative restrictions. Carried to its full logical consequences, the definition of convertibility most prevalent today — *i.e.* the elimination of all quantitative trade and exchange restrictions — should therefore lead us to confuse convertibility with the Manchesterian ideal of Free Trade.

Practical policy aims, however, can rarely be enclosed into rigid logical definitions. If we wish to designate as " convertibility " feasible goals of international economic policy, susceptible of concrete implementation in a concrete historical environment, we will have to define convertibility in relative, rather than in absolute, terms. The nineteenth century experience suggests that convertibility be defined as an institutional framework which minimizes the most harmful forms of State interference with mutually beneficial economic relations among sovereign nations. This should imply a maximum degree of multilateralism, stability and freedom in the international trade and payments system, but would not require full and unconditional compliance with any of these three criteria.

The first should probably be regarded as the most crucial, and also the easiest to achieve. Its opposite extreme — bilateralism — marked the utter breakdown of convertibility in the early postwar years. The near elimination of bilateralism after 1950 was primarily the result of the European Payments Union Agreement and of the

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(8) Such a distinction is approximated, but no more than approximated, by the line currently drawn between " resident " and " non-resident " convertibility. Convertibility of sterling for non-residents, for instance, means that sterling area residents may remain subject to various degrees of restrictions on foreign transactions, but that current earners of sterling outside the sterling area may use such earnings freely for settlements — at least on current account — not only in the sterling area, but anywhere in the world. This goes very far indeed toward the practical elimination of bilateral trade and payments techniques, but still leaves the door wide open to the application of stringent discriminatory restrictions on sterling area residents' trade with the countries which would otherwise use their sterling earnings in such a way as to expose the United Kingdom to a serious drain on its gold and hard currency reserves. The threat of such discriminatory application of restrictions on residents may be used to exact bilateral concessions or preferences from these countries.

OEEC Code of Liberalization. Yet, both of these Agreements accepted implicitly some degree of discrimination as a price worth paying for the outlawing of bilateralism and the gradual lifting of quantitative restrictions in intra-European trade.

Although non-discrimination should be regarded as one of the pillars of nineteenth century convertibility, it did not operate even then as an ironclad rule in practice. Non-discrimination was then spelled out in the famous " most-favored nation " clause enshrined in most trade and tariff treaties. This clause, however, was subject to a number of qualifications and exceptions. Regional preferences — particularly within the British Empire — were traditionally allowed among some countries closely linked together by geographical, historical or political bonds. Non-discrimination was also tempered by reciprocity criteria in the case of countries — primarily the United States — which insisted on a *conditional* interpretation of the most-favored nation clause. Finally, the clause was also circumvented occasionally through ridiculously minute definitions of tariff nomenclature, designed to limit the benefits of a new concession to one or a few countries only.

Yet, these exceptions remained exceptions. Their overall quantitative impact was moderate, and they never opened the door to any significant extension of bilateralism in international trade and payments. As long as this was true, trade and tariff restrictions protected national producers against foreign competition only within their own country's boundaries. Equal access of all countries' producers to third markets preserved the full interplay of competitive forces among exporters the world over, and forced each country to maintain internationally competitive prices and costs, in order to retain a level of exports sufficient — together with other net receipts or expenditures on service and capital accounts — to finance its own payments abroad for merchandise imports.

It is indeed very tempting therefore to identify convertibility with multilateralism, and as perfectly compatible with a non-discriminatory, or at least non-bilateral, use of tariffs or other trade and exchange restrictions. Yet, this could lead to absurd conclusions as a criterion for international policy. Sufficiently high or unstable levels of non-discriminatory restrictions could stifle trade altogether and be far worse, as a result, than more moderate levels of moderately discriminatory restrictions. Practicable convertibility aims should make room for feasible compromises between the three ideal

criteria of multilateralism, stability and freedom in international economic relations.

For reasons that will soon become apparent, these compromises may have to remain short in every respect of those that could be implemented under nineteenth century conditions. Tariff restrictions were then extremely moderate by modern standards, and quantitative restrictions practically unknown. Most of all, tariff duties were changed infrequently and were often consolidated for long periods of time through trade treaty negotiations. They were used primarily for revenue or protection purposes, but hardly or not at all as a technique for balance of payments adjustments.

Since, however, no country — wether convertible or not — can escape the necessity of balancing its overall accounts with the rest of the world, the maintenance of nineteenth century convertibility depended on the implementation of other techniques of adjustment, alternative to the use of trade or exchange restrictions and of changes in exchange rates. To the extent that these nineteenth century techniques of adjustment may no longer prove workable or acceptable today, new ones will have to be put in their place, or our convertibility objectives will have to be tailored down to less ambitious criteria than those of yesterday. The exploration of these policy issues will be reserved for a later article in this Review.

What Made Convertibility Work before World War I?

What made convertibility workable before 1914, and what made it unworkable in all of the following forty-five years, except for the brief bonfire of the late 1920's?

Theoretical and textbook discussions tend to stress primarily in their answer to these two questions the corrective mechanism of balance of payments adjustments. Classical theory emphasized the role of money flows and their impact upon "corrective" price adjustments and the restoration of a competitive pattern of international prices and costs. Modern theorists have placed greater emphasis on the mechanism of income transfers and their impact upon economic activity and employment, as well as upon prices and costs. Their analysis did not weaken, but strengthened, the classical view as to the effectiveness and equilibrating tendencies of balance of payments adjustments. It raised serious doubts,

however, about the theoretical desirability and practical acceptability of such a mechanism whenever its main burden falls upon economic activity and employment rather than on price adaptations. The breakdown of convertibility after the first world war was thus ascribed to the growing rigidities which interfered with price, cost and wage adaptations, to the consequent impact of convertibility adjustments upon the levels of economic activity and employment, and to the political and social resistance which this would evoke from governments and public opinion.

I have no quarrel with this analysis, but feel that it does not make sufficiently explicit some of the institutional factors which explain the success of nineteenth century convertibility.

One of these has received considerable attention from Taussig and from his students: it is the enormous scope which capital movements gave to the financing and cushioning — and therefore to the perpetuation rather than the correction — of current account disequilibria. Large, persistent and often growing disequilibria showed no sign of, or need for, correction over several decades, or even over the whole century separating the Napoleonic wars from the first world war. The net capital inflow into the United States, for instance, is estimated to have averaged $50 million a year or more throughout the period from 1850 to 1914, while the net outflow of capital from the United Kingdom rose from about $30 million a year in the first half of the century to approximately $250 million in the second half, and close to $900 million in the last years (1906-1913) before the first world war (9).

This did not mean, of course, that all need for *corrective* adjustments was thereby eliminated, and that private capital movements would automatically cushion any trend toward imbalance in a country's international accounts. On the contrary, the availability of cushioning capital on such a scale was very much dependent on the fact that residual deficits — on current *plus* private capital account — could be expected to be corrected relatively promptly and smoothly. Yet, as long as this mechanism functioned, it made it easier for the deficit countries to accept and

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(9) These estimates are derived from the *Balance of Payments Statistical Supplement* published in 1958 by the Department of Commerce (p. 10), and from ALBERT A. IMLAH, "British Balance of Payments and Export of Capital, 1816-1913", in *Economic History Review*, 1952, pp. 208-239.

implement such residual adjustments without recourse to trade or exchange restrictions and, in most cases, without recourse to exchange depreciation.

The second factor which explains the successful functioning of nineteenth century convertibility lies in the fact that the emergence of *major* imbalance was *prevented ex ante* by the institutional monetary and banking framework of the times, rather than *corrected ex post* by large price and income adjustments. In spite of the greater flexibility of prices and costs in the nineteenth century, I doubt very much whether a 20 or 30 per cent reduction in wages, if called for to restore equilibrium in the balance of payments, would have been tolerated then any more than it would be today. The fact is that the ability of the system to correct such major maladjustments through internal price and income adaptations was rarely put to a test in the major Western countries which constituted the core of the system. Whenever it was put to such a test — as it repeatedly was in most Latin American countries — the correction was uniformly brought about by currency devaluation rather than by the internal adaptations postulated by the gold standard system.

Price increases and balance of payments deficits are alternative — and often complementary — forms of adaptation to an *ex ante* excess of expenditures over production. Such a gap can arise only if it is financed, and its financing, for a country as a whole, can come only from two sources: net foreign disinvestments by the non-bank sectors of the economy, or net borrowings from the domestic banking system (10).

The first of these two techniques of financing leaves the banking system unaffected and does not, therefore, raise any convertibility problem as such. The inflow of funds from abroad — or the disinvestment of funds previously accumulated abroad — provides, moreover, not only the overall financing of excess expenditures, but also the foreign exchange needed to finance the excess of imports over exports. Moderate price rises would suffice to

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(10) The Organization for European Economic Cooperation will publish in the near future comprehensive estimates of postwar monetary developments in the seventeen member countries, in which the type of analysis briefly summarized in the above sentence is fully explained and applied to empirical data. Puzzled readers may, in the meantime, consult my discussion in *Europe and the Money Muddle*, pp. 49 and 53, and in "A Simplified Scheme for the Integration of Monetary and Income Analysis", in Vol. IV, pp. 293-311 of the *Memoria* of the Fifth Meeting of Technicians of Central Banks of the American Continent, published by the Banco de la República, Bogotá (Colombia), 1957.

stimulate such excess imports, and these would, in turn, act as a brake on larger price increases. We have already noted above the enormous role played by such external financing in nineteenth century balance of payments adjustments.

A peculiar form of net foreign disinvestment lay in the financing of excess expenditures from existing cash holdings of internationally acceptable gold — and initially silver — coins. As different from today, a substantial portion of the currency holdings of the public consisted in such international moneys, rather than in fiduciary claims on the domestic banking system. The financing of excess expenditure through such dishoardings of international cash would automatically provide also the foreign exchange needed to finance excess imports and limit the possible extent of domestic price rises.

Convertibility problems could only arise if the financing of excess expenditures were fed by an expansion of bank credit or a contraction of outstanding claims — particularly paper money and deposits — on the domestic monetary and banking system of the country. The difficulties to which such financing could give rise, however, were not necessarily tied to balance of payments deficits, and did not necessarily involve the fate of the national currency as such. They would focus, on the first instance, on individual banking institutions whose rate of credit expansion had been excessive in relation to others, and this could come about regardless of the balance of payments of the country as a whole. The improvident bank might be forced to suspend its payments, but this would affect only the liquidity of its own depositors, and not the currency of the country in general. In most cases, of course, Central Bank assistance would be made available in time to meet the problem, but again not on a scale endangering the liquidity of the Central Bank itself and the solidity of the national currency. The other credit operations of the Central Bank, both with its private customers and with the State, would also be geared to the preservation of its own liquidity position, rather than to national objectives such as the maintenance of full employment, price stability or balance of payments equilibrium.

These financial traditions created, wherever they were observed, the most effective barrier against inflationary excesses susceptible of entailing large-scale price and cost maladjustments. They were, of course, dependent themselves on the predominantly *laissez faire*

philosophy of the influential financial, economic and political circles of each country. Occasional departures from these accepted canons of behavior might be forced upon the authorities by foreign or civil war, but were mostly limited to underdeveloped countries not linked politically to the West. Outside of such accidents, the major fluctuations in prices and economic activity were roughly parallel among the major trading countries and required only moderate readjustments to preserve currency convertibility.

The Collapse of Convertibility after World War I

This spontaneous harmonization of internal financial policies has been hopelessly shattered as a result of the two world wars and, even more, of the world depression. New philosophies and techniques of national policies have emerged which subordinate, whenever the two enter in conflict, the preservation of exchange freedom and stability to other and overriding national objectives. These new techniques involve, in the field of trade and finance:

1. the extensive use of the issue power of central banks to underwrite the State's own deficits and, in addition, the credit expansion of other banks whenever such expansion conforms to the wishes, or even merely to the existing regulations, of the national monetary authorities;

2. the unwillingness to subordinate fully such credit policies to the preservation or restoration of a competitive price and cost pattern and of an overall external balance, at current prices and exchange rates, compatible with the availability of gold and foreign exchange reserves;

3. the recourse to currency depreciation, to trade and exchange restrictions, or even to generalized rationing controls, or a combination of such measures, whenever the country is forced by the exhaustion, or near exhaustion, of its monetary reserves to adjust its external expenditures to its external receipts.

The broad consequences of this institutional evolution for the world's trade and payments system have been the breakdown of the gold standard during the interwar and postwar periods, *i.e.* the generalization of exchange instability and of trade and exchange restrictions. The breakdown was a gradual one and culminated

in the unbridled bilateralism of the early postwar years. The disadvantages of such a system, for each country as well as for the international community as such, finally became sufficiently obvious to all to prompt patient and determined efforts to reverse the process and restore freedom and stability in external trade and payments arrangements.

I shall reserve for later discussion the examination of the techniques which have proved most feasible and successful in this respect, and concentrate attention at this stage on the impact of the policies described above on capital movements and the role of monetary reserves.

II. The Changing Role of Monetary Reserves

These radical changes in the international and national monetary and banking systems have fundamentally altered the role of monetary reserves and other capital movements in balance of payments adjustments.

Current discussions of reserve requirements stress primarily the role of reserves in the cushioning of balance of payments deficits, and rely for an approximate, and admittedly very rough, measurement of reserve adequacy on the ratio of a country's overall reserves to annual imports or exchange sales. Such a concept, however, would have been largely alien to nineteenth century writers, and did not indeed play any prominent role in either academic or policy analyses of the problem until the second world war (11). Legal prescriptions on monetary reserves and monetary issues varied widely from country to country, but never made any reference to a country's export or import levels. They were concerned exclusively and directly with the avoidance of excessive currency issues and relied for this purpose either on an overall ceiling on such issues, or on the limitation of fiduciary issues — *i.e.* the amounts that could be issued over and above the metallic reserves held as counterpart by the issuing bank — or on a minimum ratio of reserves to note issues or sight liabilities. This latter criterion was the one that

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(11) Its explicit recognition as one of several criteria for Central Bank management was introduced for the first time in Central Bank legislation in 1944. See the author's *Monetary and Banking Reform in Paraguay*, Board of the Governors of the Federal Reserve System, Washington, 1946, pp. 82-84, and 136-37.

conformed most closely to practical bankers' experience as to their own liquidity requirements, and tended more and more to determine legal or customary standards of reserve adequacy. The maintenance of a ratio of about one third between liquid reserves and sight obligations gradually became the usual minimum benchmark for central bank as well as for commercial bank operations.

It hardly need be said this could result in extremely disparate ratios between central bank reserves and the level of the country's imports. This ratio can be estimated, for instance, to have been less than 5 per cent for the Bank of England in 1913, as compared to more than 40 per cent for the Bank of France (12). This contrast was not without significance for monetary management, and complaints were often voiced against the frequency with which the Bank of England had to resort to changes in the discount rate in order to protect its slender level of reserves. The Bank, however, was a private firm, motivated by the search for profits as well as by broader considerations of public service, and showed great reluctance to accumulate non-earning gold assets greatly in excess of liquidity requirements as judged in the light of its own experience in the past. Private capital movements were regarded as the normal source of cushioning for balance of payments fluctuations, and could be hastened, whenever necessary, by open market operations and changes in the discount rate. The main test of this mechanism, from the Bank's point of view, lay in the fact that any substantial drain on its gold reserves could be arrested long before it would endanger the Bank's own liquidity.

The radical changes imparted to monetary institutions and policies by the first world war and the world depression have completely revolutionized the role of monetary reserves and have consequently brought about fundamentally different views as to their measurement and adequacy.

First of all, the universal disappearance of gold coin from active monetary circulation has deeply modified the significance of central bank liquidity. Reserves need no longer be held to convert bank deposits and paper currency into legal gold tender for purposes of

(12) Only a minor portion of this striking contrast is due to the difference in the ratio of gold reserves to liabilities for the two banks (approximately 35% for the Bank of England, and 50% for the Bank of France). Most of it can be ascribed to the much greater role played in England by private bank deposits in total money supply and by the much higher ratio of imports, and lower ratio of money, to GNP in England as compared to France.

domestic circulation. Reserve drains are now associated exclusively with external deficits in the balance of payments of the country. In a closed economy, central bank liquidity would be fully assured by its mere ability to print notes. Excessive issues would be reflected in inflationary pressures upon prices, but would not affect the bank's liquidity.

Secondly, international flows of private capital can no longer be relied upon as a major source of cushioning for current account disequilibria. Fears of currency depreciation and exchange restrictions often indeed tend to stimulate private capital flows from deficit countries to surplus countries, and to aggravate, rather than cushion, the impact of current account imbalance (13). These movements of "hot money" played a particularly large role in the interwar period and continue even today to elude, in many cases, the nets of exchange control legislation. On the other hand, the unprecedented development of official loans and grants provides today vast amounts of cushioning capital, which substitute in part for the private capital flows of the gold standard era. The International Monetary Fund, the International Bank for Reconstruction and Development, the European Payments Union, the European Fund, the Colombo Plan, etc. were specifically set up for that purpose. France and England have also stepped up enormously financial aid to their overseas territories and associated monetary areas. The Marshall Plan and other U.S. foreign aid programs completely dwarfed, in the early postwar years, the rather modest flows of private investments abroad and still account today — even after excluding military grants — for about half of the United States total capital exports.

Official grants and loans, however, cannot be regarded as a normal and dependable source of financing for short-run disequilibria. They usually require long and uncertain negotiations whose ultimate success may also be made dependent at times on political or economic conditions unacceptable to the prospective borrower. In spite of the more flexible and automatic procedures recently developed by the International Monetary Fund — and, up to its recent demise, by the European Payments Union — countries must

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(13) International political tensions are a further factor of instability which would continue to paralyze or distort capital flows even if full confidence could be restored in the wisdom of economic policies proper.

still look today to their own monetary reserves as their first and most important line of defense against temporary deficits in their balance of payments.

The main function of monetary reserves is no longer to preserve the overall liquidity of individual central banks, but to permit the financing of short-run deficits in the country's external transactions. The types of deficits which may appropriately be met in this manner fall into two categories. The first is that of reversible deficits reflecting purely temporary fluctuations in foreign receipts and expenditures on current and capital account. Such deficits should obviously be financed, rather than prevented or immediately corrected by policy action. Basic policy adjustments — such as deflation or devaluation — to temporary factors of imbalance would indeed sow the seeds of more fundamental and lasting imbalance in the country's economy. The shortage of reserves is more likely to induce, in such cases, a recourse to trade or exchange restrictions which would have been perfectly avoidable otherwise.

The second case is that of more fundamental disequilibria, calling for corrective action, but in which the most appropriate and desirable remedies will act relatively slowly and smoothly, and leave residual needs for the financing of tapering off deficits.

In both cases, an insufficient level of reserves will force the deficit country to resort to otherwise unnecessary measures of deflation, devaluation or restrictions to keep its payments in closer and more continuous balance with its receipts than would be called for by the need to preserve long-run equilibrium in its international transactions.

III. Reserve Measurement and Adequacy Criteria

These deep-seated changes in the role of monetary reserves entail corresponding changes in their methods of measurement and criteria for adequacy. Neither, however, can be couched in any precise and clear-cut formula, invariant from time to time and from country to country. Reserves have to be higher in an unstable economic and political environment than in a world enjoying a greater degree of economic and political stability. Higher reserves are also needed by underdeveloped countries, with more volatile levels of export proceeds and capital imports, than by the richer

and more diversified economies of the industrial countries. The burden of reserve accumulation, however, in relation to national wealth and savings on the one hand, and competing needs for the financing of developmental imports on the other, will unfortunately be higher for the former countries than for the latter. In this balancing of needs and costs, the underdeveloped countries are likely therefore to assign a lower priority than the more developed countries to a reserve level adequate to eschew or minimize undesirable resort to devaluation or restrictions.

The appraisal of reserve needs for any individual country, at any particular time, would have to take these and other factors into account. The order of magnitude of future deficits calling for reserve financing might first be gauged quantitatively on the basis of past experience. This first approximation should then be revised, upward or downward, in the light of other pertinent evidence about the probable course of external and internal developments (14).

Such a line of approach, however, cannot be used in a broad survey of world liquidity requirements, such as the one which will now engage our attention. Availability of data and simplicity of calculation inevitably dominate the choice of measurement methods applicable to such comprehensive inter-temporal and inter-country comparisons. Their results would admittedly be too crude to determine any precise level of reserve adequacy, but they will prove more than sufficient to indicate whether current and prospective reserve levels are likely to facilitate, or seriously hamper, the smooth functioning of international currency convertibility.

The ratio of gross reserves to annual imports will be retained in all that follows as a first, and admittedly rough, approach to the appraisal of reserve adequacy. The main reason for this choice, I must confess, is the fact that the recent study of the IMF staff on *World Reserves and Liquidity* (15) conveniently presents such ready-made calculations for eleven prewar and postwar years for all regions of the world and for more than sixty individual countries. The

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(14) The ratio of reserves to money and other liquid claims on the banking system may be of particular relevance, for instance, if past "compensatory" policies have pushed the ratio of such liquid claims to GNP to an abnormally high level. The current status of private banks' cash reserves and the strength or weakness of the legal or regulatory controls exercized by the monetary authorities over the banks' credit policy will also influence the speed with which corrective action may be applied in case of need.

(15) Washington, 1958.

second is that this ratio is the one that has been most popularized in all postwar discussions of the subject, and that monetary authorities in many countries are apt to think of reserve adequacy in these terms, and to act accordingly (16).

It should finally be noted that the estimates of monetary reserves used in these calculations give an exaggerated impression of definiteness and of comparability over time and over space. Methods of reporting are not uniform in all countries, and, most of all, the true "reserve" character of the sterling assets reported varied considerably over the period. The usability and acceptability of "transferable", and particularly "bilateral", sterling accounts were severely limited in the early postwar years. This was of minor importance to countries normally in deficit with the United Kingdom or the sterling area, but highly significant for countries whose bilateral deficits with other countries — particularly in the dollar area — could not be settled through the use of such sterling balances.

Moreover, the Fund's attempted breakdown of foreign exchange reserves into their major components (sterling, dollar, EPU and BIS claims) can only be regarded as a rough approximation. This qualification, once again, applies particularly to official holdings of sterling, for which estimates have only recently been made available and only for the end of 1945, 1951 and 1957 (in *Economic Trends*, May 1958, p. viii). The Fund's estimates include as official all sterling holdings except those held in the United Kingdom's colonies and in the dollar area.

Important as they would be for a more refined analysis, these qualifications are not too damaging for the broad appraisal of reserve adequacy to which we shall now turn. They will be duly noted again in the few cases in which our conclusions, based on rough orders of magnitude only, could be significantly affected by them.

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(16) My own preference would have gone otherwise to a ratio of reserves to balance of payments *receipts* — rather than expenditures — on current — rather than merely merchandise — account, but including also net private unilateral transfers which play an important equilibrating role in several countries' balances of payments. The arguments that may be marshalled for and against this view are not worth retaining the attention of the reader, since the matter is only of academic interest, both methods of measurement leading to similar results in all but very few cases.

Economic students should devote some time, instead, to the closely reasoned and suggestive discussion of reserve adequacy by Tibor Scitovsky in *Economic Theory and Western European Integration*, Stanford University Press, 1958, pp. 101-109.

IV. Reserve Adequacy at the End of 1957

Reserve levels, as of the end of 1957, may be appraised first in the light of past experience and, secondly, with reference to what may be known, or guessed at, of individual countries' own estimates of reserve requirements.

The Overall Historical Record: 1913-1957.

Gold and foreign exchange reserves for the world as a whole were estimated by the Fund at about 49 per cent of imports at the end of 1957, compared with 42 per cent in 1928 and only 21 per cent in 1913; and gold reserves alone to 35 per cent, compared to 32 per cent in 1928 and only 19 per cent in 1913 (17). These estimates, however, exclude gold coin in circulation outside Central Banks and Treasuries. This exclusion is hardly defensible in view of the large role which private gold holdings played before the first world war in balance of payments adjustments. While not directly under the control of the monetary authorities, they often constituted a powerful adjunct to central bank reserves in times of difficulties (18). If gold circulation is taken into account, the ratio of monetary gold to imports shows up in 1957 as about equal to that of either 1913 or 1928 (35 to 36 per cent). This, however, was rather low by previous standards (19), far lower than in the 1930's (about 100 per cent) and substantially lower than in the late 1940's (55 to 60 per cent).

Such comparisons are not very relevant, and this for a variety of reasons.

First of all, foreign exchange reserves have played since the first world war a much larger role in the world monetary system

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(17) *International Reserves and Liquidity*, p. 18.

(18) In his study on *British International Gold Movements and Banking Policy, 1881-1913* (Harvard University Press, 1935), W. Edwards Beach draws attention to the high inverse correlation between foreign and internal movements of gold, both in the United States (p. 146) and in the United Kingdom (pp. 76-77). External gold drains in settlement of balance of payments deficits were partly fed and offset by the simultaneous contraction in the internal circulation of gold coin and its reflux toward the Bank.

(19) Spot calculations for the late nineteenth century, based on estimates of the Gold Delegation of the League of Nations, yielded a ratio of about 38 per cent, in 1873, 1880 and 1890, but of approximately 45 per cent in 1868 and 1897.

than they did in the nineteenth century. These reserves consist very largely in the short-term foreign liabilities of the United States and the United Kingdom whose *gross* reserve position in relation to imports can no longer, therefore, be regarded as an appropriate measure of these countries' liquidity. Any average ratio of gross reserves to imports for the world as a whole is highly misleading for that reason alone, and, moreover, totally unrepresentative, because of the excessive weight given to the abnormally high reserves of the United States and the admittedly low reserves of the United Kingdom.

The least objectionable procedure is to consider separately the position of these two countries as world monetary centers, and to confine attention at this stage to the gold and foreign exchange position of countries other than the United States and the United Kingdom.

The ratio of these other countries' total reserves to their imports is just about equal to what it was in 1913, but substantially lower than in any of the other years recorded in Table I.

We may discard immediately as far in excess of minimum requirements the abnormally high ratios of reserves to imports typical of the 1930's. These were indeed the combined result of widespread devaluations and of catastrophic declines in the value of world trade.

We should also discount somewhat the high reserve levels shown for the early years following World War II, since these were swollen by large holdings of inconvertible sterling, which could hardly be regarded as fully equivalent to international reserves. Nobody indeed would suggest that the international reserves position was more comfortable and adequate in the early postwar years than it is today.

The radical institutional changes which have taken place since 1913 and 1928 also preclude any direct comparisons with those years. The fact that current reserves are *lower* than they were then, however, may be retained as significant, since these changes are all of such a nature as would require a *higher* ratio of reserves to imports to facilitate the maintenance of convertibility in the face of a greater variability in national policies and of far less favorable conditions as to the size and direction of capital movements in times of crisis. It should not be forgotten, moreover, that serious worries

about the adequacy of reserves existed also in 1928 and had prompted at the time an extensive investigation by the Financial Committee of the League of Nations (20).

TABLE I

RATIO OF MONETARY RESERVES TO ANNUAL IMPORTS, 1913-1957
(in per cent)

	All Countries			All Countries, excluding the US and the UK					
	Total	Gold	Foreign Exchange	Total	Gold	Foreign Exchange			
						Total	Dollar	Sterling	EPU-BIS
Including Gold in Circulation:									
1913	39	36	2	35	32	3			
1928	46	35	11	44	28	16			
Excluding Gold in Circulation:									
1913	22	19	2	20	17	3			
1928	43	32	11	42	26	16			
1932	97	89	8	85	74	11			
1937	100	92	8	55	44	12			
1938	118	110	8	62	51	11	3	8	—
1947	87	61	26	54	19	35	5	31	—
1948	78	55	23	46	15	31	6	25	—
1949	73	55	18	40	16	24	6	17	—
1950	80	57	23	50	19	30	10	18	1
1951	58	42	16	37	15	22	7	13	1
1952	59	42	17	38	16	22	8	11	2
1953	64	45	19	44	18	26	11	12	3
1954	63	44	20	44	18	26	12	12	3
1955	58	40	18	42	18	24	12	10	2
1956	54	37	17	39	17	22	11	8	2
1957	50	35	15	35	16	19	9	7	2

Sources and Notes: see Table in Appendix.

Only one fact need be retained from the record examined up to now. Reserves at the end of 1957 were at an all time low in relation to the last hundred years, and had been declining at a rather alarming pace since the end of 1954. They represented 35 per cent of annual imports for all countries other than the United States and the United Kingdom, taken as a group. Can anything more

(20) See above, p. 5 and footnote (3).

be said about the probable adequacy or inadequacy of such a level of reserves for the maintenance of a workable system of international convertibility?

National Reserve Requirements under Convertibility.

For reasons amply discussed in the first section of this study (21), the appraisal of desirable and feasible reserve levels in relation to imports varies enormously from country to country. In addition to the structural factors mentioned in this discussion and which facilitate or hamper the maintenance of high reserve levels (relative levels of wealth and savings, ratios of bank money to total money, and of money and imports to GNP, etc.), some countries are less able or insistent than others in restraining inflationary pressures and in avoiding recourse to trade and exchange restrictions.

The Fund's study lays great stress on the variations. A series of tables stresses the enormous variations in reserve ratios from country to country as well as from one year to another. In 1957, reserves were only 1 per cent of imports in Bolivia, but 137 per cent in Portugal. The number of industrial countries — excluding the United States and the United Kingdom — with reserves below 30 per cent of imports doubled — from one fourth to one half of their total number — between 1955 and 1957. In the latter year, twenty-seven per cent of the non-industrial countries showed reserve ratios inferior to 20 per cent, as against eight per cent only four years earlier.

These wide variations conceal, however, some broad trends and regularities duly noted in the Fund's report. Thus, a large number of non-industrialized countries unwillingly accumulated abnormally high reserves in wartime, but drew heavily on them for re-stocking and development when supplies became again available. The average reserve ratio for this group of countries thus fell from 73 per cent in 1948 to 37 per cent in 1957. Continental Western Europe, on the other hand, suffered heavy reserve losses in wartime and in the early postwar years, but more than doubled its reserves between 1948 and 1957.

Within each group, some countries — such as Switzerland, Portugal, Venezuela, Iraq, Iran and Uruguay — persistently tend,

(21) See particularly pp. 17 and 19-20.

for a variety of reasons, to maintain relatively high reserve levels, while others — Norway, Denmark, Yugoslavia, Israel, Malaya, Canada and South Africa, for instance — seem to be stisfied with reserve levels well below 30 or even 20 per cent of imports (22).

VARIATIONS IN REGIONAL RESERVE LEVELS — TABLE II

	1928	1937	1948	1957
I. *In per cent of Imports*	*43*	*109*	*89*	*55*
A. Continental OEEC	46	78	40	42
B. Non-Industrial Areas	42	51	73	37
1. Latin America	47	51	44	41
2. Outer Sterling Countries	28	46	95	41
3. Other Countries (1)	50	67	74	30
C. Canada	7	21	33	29
D. United Kingdom	13	81	24	21
E. United States	85	358	303	161
II. *In per cent of World's Gross Reserves*	*100*	*100*	*100*	*100*
A. Continental OEEC	39	24	13	28
B. Non-Industrial Areas	25	14	28	21
1. Latin America	9	3	6	7
2. Outer Sterling Countries	6	5	16	8
3. Other Countries (1)	11	6	7	6
C. Canada	1	1	2	3
D. United Kingdom	6	15	4	4
E. United States	29	46	52	43

Footnote: 1. Including Japan.

Source: *International Reserves and Liquidity*, Appendix Table 1, pp. 100-101. Discrepancies between these estimates and the global estimates of Table I are due to minor discrepancies in the Fund's estimates themselves, but primarily to the exclusion of colonial territories from the present Table.

The differences in national conditions and policies reflected in these estimates are not as significant as would seem at first — and

(22) See *International Reserves and Liquidity*, pp. 46-55, and Table II in the text. Substantial reserve declines in the non-industrialized areas, however, occurred between the end of the war and 1948 and are not shown in the table.

as the Fund's study sometimes suggests (23) — for an appraisal of liquidity requirements for the world as a whole, under conditions of monetary convertibility. There are two reasons for this. The first is that few of the countries with persistently low reserves account for a significant proportion of total world trade, while most of the large trading countries traditionally hold reserves well in excess of 30 per cent. The second is that most of the countries with low reserves also maintain much more stringent trade and exchange restrictions than the others. Both of these facts will be brought out in Tables III and IV below. What they suggest is that:

1. some countries may indeed continue to hold relatively low reserves, but are also likely to have great difficulties in restoring and maintaining convertibility;

2. the maintenance of international convertibility, however, depends primarily on the policies of the major trading countries, and the avoidance of trade and exchange restrictions by them is clearly related to their ability to maintain adequate reserve levels (24);

3. the reserve requirements of the latter countries exercise an overwhelming influence — as compared to those of the smaller trading countries — on the world demand for monetary reserves.

Table III classifies the sixty-two countries (other than the United States and the United Kingdom) for which reserves are reported by the Fund into three groups, on the basis of their average ratio of reserves to imports over the three most "normal" years of the postwar period, *i.e.* 1953-1955. The number of countries in each group is approximately the same, but those with reserves lower than 33 per cent of imports accounted for only one fifth of total imports, and for less than one tenth of total reserves. All of them, moreover, were characterized by much tighter trade and exchange restrictions than those applied by most of the countries with higher reserve levels.

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(23) See, for instance, the comments on p. 73 of the Fund's study.

(24) Bilateralism will remain confined to a very minor portion of world trade at most as long as the United States, Canada and Western Europe — with which most of the other countries' trade also takes place — refuse to participate in bilateral agreements. The functioning of the nineteenth century gold standard depended essentially on the policies of the major trading countries, and was never endangered by the exchange rate instability of other countries, particularly in Latin America. The same would hold today for exchange restrictions outside Europe and North America.

TABLE III

AVERAGE RESERVE LEVELS, 1953-1955

(All countries, excluding the United States and the United Kingdom)

	Average Ratio of Reserves to Imports	Number of Countries	Proportion of Total Imports	Proportion of Total Reserves
I. *Reserves Below 33% of Imports:* Yugoslavia (6), Denmark (13), Norway (15), Paraguay (16), Bolivia and Chile (18), Peru and Spain (19), Haiti and Israel (21), Costa-Rica (22), Nicaragua and Iceland (23), Taiwan and South Africa (25), Malaya (26), Sweden (27), Syria and Finland (29), Colombia (31).	22 %	21	20 %	9 %
II. *Reserves from 33% to 50% of Imports:* Dominican Republic and France (33), Mexico, Korea and New Zealand (34), Philippines (35), Honduras and Ecuador (36), Brazil (37), Indonesia (38), Canada (39), Lebanon (40), Turkey and Belgium (42), Italy (43), Japan and Netherlands (45), Ireland (46), Vietnam (47), Venezuela (49), Guatamala and Salvador (50).	40 %	22	52 %	43 %
III. *Reserves above 50% of Imports:* Argentina (51), Ceylon and Austria (52), Germany (54), Panama (56), Greece (60), Australia (61), Burma (76), Cuba (78), Ethiopia (81), Iran (85) ,Thailand (89), Pakistan (101), Iraq (106), Uruguay (110), India (136), Egypt and Switzerland (137), Portugal (180).	81 %	19	28 %	48 %
Total	48 %	62	100 %	100 %

Source: *International Reserves and Liquidity*, Appendix Table 1, pp. 100-101.

The other forty-one countries accounted for 80 per cent of the total imports, and more than 90 per cent of the total monetary reserves, of the sixty-two countries taken together. They included all the European countries outside of Scandinavia and Iceland, and all the other countries with imports in excess of $1 billion a year,

except South Africa and Malaya. It is these countries' policies — and, of course, those of the United States and the United Kingdom — that will overwhelmingly determine the fate of the present convertibility experiment. These policies will be very largely influenced, in turn, by these countries' ability to preserve reserve levels sufficient to eschew unnecessary resort to trade and exchange restrictions. And it is the global level of these reserve requirements in relation to available supplies from gold production and other sources — primarily dollar and sterling balances — that will play a crucial role in determining the adequacy or inadequacy of world reserve levels for the maintenance of convertibility tomorrow.

Twelve of these forty-one countries accounted for about 60 per cent of the total imports of the sixty-two countries taken together, and for 65 per cent of their total monetary reserves. Their actual reserve ratios in each of the eight years 1950-1957 are shown in Table IV. Only in three cases did they fall below 20 per cent. Two

TABLE IV

EVOLUTION OF TWELVE MAJOR TRADING COUNTRIES' RESERVES, 1950-1957
(percentage ratio of reserves to imports)

	1950	1951	1952	1953	1954	1955	1956	1957	Number of cases		
									below 20%	20-32%	33% and above
Canada	55	44	42	38	43	37	31	29	—	2	6
Germany	10	15	31	52	58	53	65	75	2	1	5
France	44	20	23	24	32	44	24	13	1	5	2
Netherlands	29	24	47	52	45	40	29	26	—	4	4
Belgium	38	40	42	44	41	40	35	33	—	—	8
Italy	59	46	39	39	43	46	41	42	—	—	8
Japan	58	46	54	37	43	54	47	24	—	1	7
Australia	92	47	52	93	61	39	49	68	—	—	8
Brazil	61	26	26	46	30	38	50	32	—	4	4
Switzerland	150	120	138	150	141	124	107	98	—	—	8
India	172	105	102	146	137	127	80	43	—	—	8
Venezuela	56	49	51	52	46	48	75	77	—	—	8
Total									3	17	76

Source: *International Reserves and Liquidity*, Appendix Table 1, pp. 100-101.

of these refer to Germany in 1950 and 1951, before that country had emerged from the economic and financial prostration in which the war had left it. The third is that of France in the middle of a severe exchange crisis in 1957. In seventeen other cases, reserves were below 33 per cent of imports. Nine of those occurred in France and Brazil and were accompanied by severe exchange controls. In all seventy-six of the other cases observed, reserves were maintained throughout above 33 per cent of imports.

The overall record of these eight postwar years strongly suggests that most of the major countries would aim at maintaining a reserve level of not less than 40 per cent in most years, feel impelled to adopt severe readjustment measures, if this level fell below, let us say, 30 or 33 per cent, and consider themselves forced to adopt drastic measures of control in the face of any persistent or substantial contraction below that critical range (25). A 20 per cent level of gross reserves would be widely regarded as an absolute minimum, to be earmarked for rare emergencies such as the outbreak of war, or as necessary collateral for the negotiation of short or medium term loans abroad.

Under normal conditions, the actual amount of reserves in excess of 33 per cent held by some countries would far outweigh the deficiencies of other countries' reserves in relation to this level. There can be little doubt, therefore, that the 35 per cent average level reached in 1957 by all countries outside the United States and the United Kingdom was on the low side of any reasonable estimate of world liquidity requirements, and that any further contraction below that level would make it very difficult for a number of key countries to adhere firmly to the convertibility policies which they would otherwise be willing and eager to pursue.

If this conclusion is accepted, two further questions must be asked:

1. Is the prospective development and supply of reserves over the next few years likely to alleviate or intensify the present reserve shortage for countries other than the United States and the United Kingdom?

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(25) The Fund's study (p. 48) also remarks that most industrialized countries "appear to have tried to achieve reserve ratios of between 30 and 50 per cent, or perhaps 40 and 50 per cent, in the sense that if reserves were below these levels they tried to increase reserves, and if reserves rose beyond some such level, they saw fit to adopt a more expansionary policy".

2. How should we appraise the present and prospective reserve position of the two center countries of the present gold exchange standard system, *i.e.* the United States and the United Kingdom?

The next sections of this paper will try to shed some light on these two problems.

V. Prospective Adequacy of Reserves over the Ten Years 1958-67

Prospective Reserve Needs.

The Fund's study on *International Reserves and Liquidity* calculates the growth of reserves which would appear necessary over the next ten years to prevent a further decline of world reserves in relation to world imports.

The Fund bases these calculations on the assumption of an average growth rate of 3 per cent a year. For the ten years 1957-66, world reserves would have to increase by $19 billion, as against rougly $7 billion expected from the monetization of new gold production and sales of USSR gold over this period. The Fund then proceeds to lower the required $19 billion to $8 billion by considering as unlikely any increase in the reserves of four high reserve countries, *i.e.* the United States, Germany, Switzerland and Venezuela. The minor gap thus left between the required growth of reserves and the amounts expected from new gold production and USSR sales should not cause any serious worry, as it may easily be bridged, and indeed more than bridged, by a further growth of foreign exchange reserves — primarily dollar balances — and by a possible decline in private gold and dollar holdings (26).

These optimistic conclusions are open to serious questions. First and foremost is the 3 per cent growth rate assumed as " normal " by the Fund. The data which underlie this assumption are presented on page 70 of the Fund's study, and are condensed here in Table V. They would hardly suggest a growth rate as low as 3 per cent. The general picture that emerges is rather one of an expanding growth rate of roughly 3 to 4 per cent in the rather depressed period of the 1880's and 1890's, of 4 per cent or more in the last decade preceding the first world war, and of 6 to 7 per cent a year both in the 1920's and in the post World War II period.

(26) See *International Reserves and Liquidity*, pp. 69-75.

TABLE V

AVERAGE ANNUAL RATES OF GROWTH OF TRADE AND MANUFACTURING, 1876-1957

(in per cent; compound basis)

	Trade		Manufacturing Activity
	Primary Products	Manufactured Products	
I. *During War Years and the 1930's Depression*			
A. From 1913 to 1920			- 1
B. From 1913 to 1921-25	- 1.5	- 2.6	0.3
C. From 1926-29 to 1931-35	- 1.9	- 5.7	- 1.5
D. From 1938 to 1948	0		3.7
II. *During "Normal" Peace-Time Years*			
A. From 1876-80 to 1901-05	3.3	2.8	4.1
B. From 1901-05 to 1913	3.5	4.7	4.2
C. From 1921-25 to 1926-29	6.3	7.1	6.8
D. From 1948 to 1956	7.5		6.1
E. From 1950 to 1956	6.5		5.7
F. From 1950 to 1957	6.3		5.1
G. From 1951 to 1957	5.4		5.0

Sources: Estimates for "normal" years are from the IMF study on *International Reserves and Liquidity*, Table 17, p. 70.

Estimates for war years and the 1930's depression have been calculated from the indices given in the original source (LEAGUE OF NATIONS, *Industrialization and Foreign Trade*, 1945, pp. 130 and 157) and quoted on p. 104 of the IMF study. Average rates of growth for these years are not shown separately in this study (except for 1938-1948) but merged into average rates over longer periods.

The 3 per cent rate assumed by the Fund becomes plausible only when "normal" peacetime experience is diluted with the abnormally low, and in fact predominantly *negative*, growth rates of wartime years and of the 1930's world depression. An expected adequacy of reserves based upon the assumption of a third world war or of another deep and protracted world depression is hardly encouraging as a guide to policy. The least that should be done, it seems to me, would be to present alternative calculations based on different rates of growth, ranging from, let us say, 3 to 6 per cent a year. This is done in Table VI, below (27).

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(27) It might also be noted that all these calculations with reference to an assumed rate of *physical* growth leave aside the impact of price rises upon liquidity requirements. This is, of course, reasonable insofar as one should not plan to increase international liquidity in

TABLE VI

INCREASE IN RESERVES CORRESPONDING TO VARIOUS RATES OF GROWTH

(in billions of U.S. dollars)

	at growth rate of			
	3 %	4 %	5 %	6 %
I. *Over the Ten Years 1958-1967*				
1. All Countries	18.5	25.8	33.7	42.3
2. Excluding United States, Germany, Switzerland and Venezuela	7.5	10.4	13.7	17.2
3. Including reconstitution of 40% reserve level by the U.K. and France	12.7	16.2	20.0	24.1
4. Per cent of (3) covered by assumed supplies from new gold production and USSR sales .	55 %	43 %	35 %	29 %
II. *In 1967*, on basis of assumption (3) above				
1. In billions of U.S. dollars	1.0	1.5	2.0	2.6
2. Per cent covered by assumed supplies from new gold production and USSR sales . .	70 %	48 %	35 %	27 %

Sources:

1. Reserve estimates as of the end of 1957 are taken from the January 1959 issue of *International Financial Statistics* ($53,600 for all countries, $31,864 million for the United States, Germany, Switzerland and Venezuela taken together, and $3,149 million for the United Kingdom and France, leaving an initial shortfall of $3,883 millions of reserves for these two countries with relation to 40% of their 1957 import levels as estimated in the same publication).

2. The estimated increase in the world's monetary gold over the ten years 1958-1967 ($7 billion) is taken from the IMF study on *International Reserves and Liquidity*, p. 72.

A second source of underestimation in the Fund's calculations is the exclusion of high reserve countries — the United States, Switzerland, Germany and Venezuela — without any parallel upward adjustment for any of the low reserve countries. On the contrary, the Fund's study comments (p. 72) that "it may be doubted whether all other countries would in fact wish to increase their reserves su much". This statement is formally correct, but also highly misleading. While it is probably true that not *all* of these countries will increase their absolute amount of reserves suffi-

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such a way as to facilitate or stimulate inflationary price increases. Yet, if such increases are not avoided in fact by the major trading countries, corresponding liquidity adaptations might be preferable to alternative adjustments such as gold revaluation or, certainly, a tightening of trade or exchange restrictions.

ciently to avoid a further decline in their already low reserve ratios, one would expect such declines to be far more than made up for by the reconstitution of adequate reserve levels by *some* at least of the countries which emphatically and rightly proclaim such an increase essential to enable them to achieve and consolidate a satisfactory rate of progress toward full currency convertibility.

Table VI adjusts the Fund's estimates for such an increase in the reserve levels of two countries only: France and the United Kingdom. The postulated increase in the reserves of these countries is one that would bring them to 40 per cent of imports. This would correspond, as of the end of 1957, to a $4,564 million reserve level for the United Kingdom and a $2,468 million reserve level for France. These figures may be compared with the $5 billion reserve level often mentioned as a target by the British in past convertibility discussions, and with the $2.1 billion reserve level actually reached by France in the closing months of 1955.

Even at the 3 per cent growth rate assumed by the Fund's study, prospective gold supplies from new production and USSR sales would cover only 55 per cent of liquidity requirements over the ten years 1958-67. This proportion would drop to 43 per cent at a 4 per cent growth rate, 35 per cent at a 5 per cent growth rate and 29 per cent at a 6 per cent growth rate. The maintenance of adequate reserve levels, under the above assumptions, would thus require increases of gold production, decreases in gold hoarding, or supplementary reserve supplies in forms other than gold, ranging from roughly $6 billion to $17 billion over the next ten years.

Prospective Supplies of Monetary Gold.

The Fund's estimate of a $7 billion increase in gold reserves over the next ten years rests on far more solid grounds than its estimate of future reserve requirements. It is based on a previous and excellent staff study (28), whose main conclusions are summarized in the first three columns of Table VII.

These estimates appear reasonable in the light of past experience. The probable value assigned to non-monetary uses of gold appears high at first view, but no longer does so when compared

(28) Oscar L. Altman, " A Note on Gold Production and Additions to International Gold Reserves ", IMF *Staff Papers*, April 1958, pp. 258-288.

TABLE VII

SUPPLIES AND USES OF GOLD

(Yearly Averages, expressed in millions of U.S. dollars at $35 an ounce)

	Forecast 1957-67			Past Averages						
	Pessimistic	Optimistic	Probable	1952-1957	1945-1951	1939-1944	1934-1938	1929-1933	1914-1928	1890-1913
1. New Production (1) . .	1050	1150	1100	940	800	1090	970	780	670	520
2. USSR Sales	—(2)	200 (2)	100	110	10	30	-10	—	—	—
3. Total Supplies (1+2=4 +5)	1050	1350	1200	1050	810	1120	960	780	670	520
4. Non-Monetary Uses (1)	*760*	*330*	*470*	*500*	*440*	*- 70*	*-310*	*480*	*280*	*220*
a. Arts and Industry .	210	130	170	210	180	100	100	100	140	130
b. Hoarding	450	200	300	290	260	-170	-410	380	140	90
5. Monetary Uses (1) . .	*390* (2)	*1020* (2)	*730*	*550*	*370*	*1190*	*1270*	*300*	*390*	*300*

(1) USSR included before 1934.

(2) Altman's study estimates USSR sales at $100 million throughout, and gives therefore a narrower range — $500 million to $920 million — for forecast additions to monetary gold.

Sources: These rough estimates have been pieced together from the following sources:

a. the International Monetary Fund: Altman's study quoted above; *International Reserves and Liquidity*; and the January 1959 issue of *International Financial Statistics*.

b. the statistical tables regularly published in the *Federal Reserve Bulletin*, and the article on *The Private Demand for Gold* in the September 1954 issue of the same Bulletin, pp. 935-944.

c. the estimates on private demand for gold, regularly published since the war in the *Annual Reports* of the Bank for International Settlements; and in the *Eighth Annual Report* (May 1938, p. 45) for the period 1931-1937.

d. the *Annual Report of the Secretary of the Treasury* for the fiscal year ended June 30, 1954, p. 294.

e. the various reports issued by the Gold Delegation of the Financial Committee of the League of Nations; and particularly in its *Interim Report* (1930), pp. 79-84, 90-94, and 114-117.

to past experience — outside the period of large-scale dishoarding which followed the revaluation of gold in the early 1930's (29) — if one takes into account the enormous increase in world incomes which has taken place since 1928. The figure given for artistic and industrial uses seems indeed exceedingly modest in the light of the League of Nations' estimates for the period 1891-1928. Overall non-monetary absorption ranged from 40 to 60 per cent of total production in every decade from 1850 to 1929. Mr. Altman himself suggests (p. 287) that from one third to one half of gold production may continue to be so absorbed in the future. Applied to the production forecasts of Table VII, this would put non-monetary absorption within a range of $380 million to $525 million, and the amounts left for monetary uses between $525 million and $970 million, with a probable value of maybe $750 million.

The most vulnerable part of these forecasts is that referring to USSR gold sales to the West. All estimates of USSR gold stocks, gold production and gold sales are, of course, highly conjectural. Mr. Altman quotes estimates of $7 billion for stocks, and of $600 million for current production in 1957. Even more conjectural is the course of future USSR policy with respect to gold sales in world markets. An aggressive use of Russia's gold resources to serve political or economic objectives would, of course, play havoc with all estimates regarding the prospective adequacy of future gold reserves.

Finally, a word may be added about another, equally conjectural hypothesis, *i.e.* the possible dishoarding of gold privately accumulated in the past. The study on *International Reserves and Liquidity* quotes (p. 66), without sources, estimates of private gold hoards "of the order of $10 to $12 billion, of which one half is held in Western Europe, and almost one third in France alone" Such estimates can only be pulled from a magician's hat, the magician being in this case the well-known gold and exchange broker, Mr. Franz Pick (30). This estimate may be compared with those pieced together in Table VIII from more official sources, and which suggest a figure of about $21 billion for "disappeared gold", but of only $8 billion for private gold hoards. The highly conjectural nature of these estimates, however, especially for the

(29) See below, pp. 37 and 38.
(30) See Mr. Altman's article, p. 286, footnote 57.

TABLE VIII

GOLD SUPPLY AND USES, 1493-1957
(in billions of dollars, at $35 per ounce)

	Production	Monetary Uses	Other Uses			Cumulative Amounts, at End of Period				
			Total	Arts and Industry	Hoarding	Gold Stock	Monetary Gold	Disappeared Gold		
								Total	Arts and Industry	Hoarding
1493–1849	5.2	1.8	3.4	2.6	0.8	5.2	1.8	3.4	5.2	1.8
1850–1869	4.3	2.7	1.6	0.9	0.7	9.5	4.5	5.0	3.6	1.5
1870–1889	3.7	1.4	2.3	1.8	0.5	13.2	5.9	7.3	5.4	2.0
1890–1913	12.5	7.2	5.4	3.2	2.2	25.7	13.0	12.7	8.6	4.1
1914–1928	10.0	5.8	4.2	2.1	2.0	35.7	18.8	16.9	10.7	6.2
1929–1933	3.9	1.5	2.4	0.5	1.9	39.6	20.3	19.3	11.2	8.1
Excluding USSR and other Eastern Europe, but including USSR Gold Sales						36.9	19.6	17.3	10.1	7.2
1934–1938	4.8	6.3	− 1.5	0.5	− 2.0	41.7	25.9	15.8	10.6	5.2
1939–1944	6.7	7.1	− 0.4	0.6	− 1.0	48.5	33.1	15.4	11.2	4.2
1945–1951	5.7	2.6	3.1	1.3	1.8	54.1	35.7	18.5	12.5	6.0
1952–1957	6.3	3.3	3.0	1.2	1.8	60.4	39.0	21.4	13.7	7.8

Notes: Sources for these highly conjectural estimates have given above, under Table VII. Post-1934 estimates are based on Federal Reserve, IMF and BIS reports and are probably reasonably accurate, except for the breakdown of "other uses", and for the *cumulative* estimates of production and "disappeared gold". These depend on a rough link over the years 1928-33 with previous estimates of the Gold Delegation of the League of Nations and on the validity of these estimates with respect to gold production for earlier years. Russian gold output up to the end of 1929 was estimated by Kitchin at £389 million (*Interim Report of the Gold Delegation*, p. 56), or about $3.2 billion in present day dollars, while our table would imply a figure of only $2.7 billion up to the end of 1933. Monetary gold estimates for earlier years include highly uncertain estimates for gold in circulation outside Central Banks and Treasuries. The figures given in the source for pre-1930 gold hoardings refer to gold hoardings in India, China and Egypt.

earlier years, deprives them of any real significance for policy. The cumulative estimates for gold hoarding in recent years are probably somewhat better, although still very far from reliable. They would suggest an increase of gold hoards of the order of $3 billion to $4 billion between 1913 and 1933, a decrease of about $3 billion between 1933 and 1944, and an increase of approximately $4 billion between 1944 and 1957.

A new wave of dishoarding, similar to that of the 1930's might possibly reduce somewhat the prospective gap between gold production and reserve requirements over the next ten years. The total amount that could realistically be expected from this source, however, would be small at best. The only case on record in the past is that of the 1930's, triggered off by a major depression and by drastic and widespread currency devaluations. Other solutions to the gold shortage problem would certainly seem to be highly desirable.

The Role of Foreign Exchange Reserves.

Foreign exchange holdings have become, in recent years, a far larger source of current additions to world liquidity than gold itself. The Fund's study on *International Reserves and Liquidity* (pp. 72-73) recalls that " all short-term dollar balances in the last decade... increased on the average by $770 million per year, and official balances alone increased by $650 million per year. Sterling balances in the past decade have naturally been reduced from the swollen heights they attained by the end of World War II... When all kinds of exchange holdings are taken together, the available data suggest that these reserves increased by a net total of about $2 billion in the past decade, or by $200 million per year ".

These facts are not in doubt, and confirm indeed the view that gold has long ceased to provide an adequate supply of international liquidity for an expanding world economy. More than half of the world's liquidity requirements have been derived in recent years from the enormous growth of foreign exchange reserves, and particularly of dollar balances, alongside with gold itself. The implications of this trend for the future stability of the world monetary system are, however, extremely disquieting.

The increase of monetary reserves outside the United States has roughly kept pace, since the end of 1949, with the expansion

of these countries' trade. Their growth over the eight years 1950-1957 has proceeded at an average rate of about 5½ per cent a year, *i.e.* close to the maximum rate envisaged in Table VI, above. Of this overall increase of $10.9 billion, however, a little more than a third (36 per cent) was fed from current gold production and USSR sales, and nearly two thirds (63 per cent) was derived from a continuous decline in the United States net reserves (31).

TABLE IX

SOURCES OF INCREASE IN MONETARY RESERVE OUTSIDE THE UNITED STATES, 1950-1957

	In millions of US dollars	In % of total
Total Increase, from:	10,936	100
1. *Decrease in US Net Reserves*:	6,851	63
a) Decrease in Gold Assets	1,706	16
b) Increase in Dollar Reserve Liabilities	5,145	47
2. *Increase in World's Gold Reserves*	3,915	36
a) New Gold Production Outside Soviet Bloc	7,342	67
b) USSR Sales	635	6
c) Non-Monetary Absorption (—)	- 4,062	- 37
3. *Other*	170	1
a) Sterling Balances	- 1,578	- 14
b) Claims on EPU-BIS	1,570	14
c) Increase in International Organizations' Gold Assets (—)	- 80	- 1
d) Other and Errors	258	2

Sources:

1. Gold production and gold reserves are taken or calculated from *Federal Reserve Bulletin estimates*, and USSR sales from the *Annual Reports* of the Bank for International Settlements.

2. All other estimates are calculated from estimates in the January 1959 issue of *International Financial Statistics* (p. 17) and from *International Reserves and Liquidity* (p. 103).

This decline, in turn, did not, until very recently, give rise to any serious concern. First of all, the United States had emerged from the war with extremely high reserves, largely in excess of any conceivable need. A more even distribution of world reserves

(31) See Table IX.

was regarded as a necessary step toward the restoration of a viable system of international convertibility. Secondly, only a small portion of the United States loss of net reserves took the form of a drain on its gold holdings. These declined only by $1.7 billion, or about 7 per cent between the end of 1949 and the end of 1957. Foreign countries accumulated nearly half of their reserve increase in the form of dollar claims rather than of gold.

TABLE X

PROPORTIONS OF GOLD AND FOREIGN EXCHANGE TO TOTAL MONETARY RESERVES OUTSIDE THE UNITED STATES AND THE UNITED KINGDOM, 1913-1957

(*in per cent*)

	Gold	Foreign Exchange			
		Total	Dollar	Sterling	BIS-EPU
1913	84	16			
1928	62	38			
1932	87	13			
1937	79	21			
1938	82	18	5	13	
1947	35	65	8	57	
1948	33	67	13	53	
1949	41	59	15	42	1
1950	39	61	19	37	2
1951	41	59	18	35	4
1952	41	59	22	28	6
1953	41	59	24	28	7
1954	41	59	26	27	6
1955	42	58	28	24	5
1956	43	57	29	22	5
1957	45	55	27	21	6

Sources: See Table in Appendix.

The question at issue is how long such a trend can be expected to continue. Past experience is not reassuring in this respect. Foreign exchange holdings — primarily pounds and dollars — constituted at the end of 1957 about 55 per cent of the monetary reserves of countries other than the United States and the United

Kingdom. Such a ratio does not appear excessive with reference to previous post-war years. Indeed, a substantially higher ratio (67 per cent) prevailed at the end of 1948, but most of it (53 per cent) was then in the form of inconvertible, and even partly blocked, sterling balances which could not be regarded as international monetary reserves in the full sense of the word.

The growth of foreign exchange reserves during and after World War II repeated, but on a much larger scale, their similar expansion after the first world war. Foreign exchange reserves had then risen from an estimated $500 million (16 per cent of total reserves) in 1913 to $3250 million (38 per cent of reserves) in 1928. This trend was encouraged by the international monetary conference of Genoa, in the spring of 1922, as a remedy to the shortage of gold. It was also propagandized throughout the 1920's by the United Kingdom, whose very low reserve position was considerably eased by foreign accumulation of sterling balances. The British return to convertibility in 1925 was thus assisted to a great degree by the maintenance of short-term balances by foreign countries in the London market.

This, however, also made the British position highly vulnerable as these short-term funds could move in and out under the stimulus of changes in relative interest rates in different monetary centers — particularly between London and New York — and of changes of expectations regarding the future evolution of exchange rates between London and other places.

The need to retain short-term funds in London by keeping higher discount rates in London than in New York was generally endorsed by Governor Strong of the Federal Reserve Bank of New York, and by the Governor of the Bank of England, Montagu Norman, but repeatedly gave rise to serious conflicts with other policy criteria in both countries. Unemployment and depressed levels of economic activities in England stimulated a clamor for easier credit policies, while credit restrictions were advocated in the United States as a necessary brake upon stock market speculation (32).

A temporary euphoria resulted, moreover, from the outflow of hot money from the continent during the years of currency

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(32) See Lester V. Chandler, *Benjamin Strong, Central Banker*, Brookings, 1958, Chapter VIII, pp. 291-331.

depreciation of the mid-1920's. The reversal of this movement was well-nigh inevitable at some point and created enormous embarrassment in London, particularly when the French franc began its spectacular recovery from 260 francs to the pound to 125 francs, after the accession to power of the Poincaré government. The Bank of France had to buy pounds massively from the market to slow down, and finally to arrest, the appreciation of the franc. The partial conversion of these balances into gold and dollars began the hemorrhage of reserves from London. The final blow came in the summer of 1931, when the development of the world crisis put into difficulties the Credit Anstalt of Vienna, triggering off a financial panic which spread rapidly throughout Central Europe and led to further and massive withdrawals of funds from London.

The devaluation of the pound, on September 21, 1931, sounded the knell of the gold exchange standard. The conversion of pounds into gold and dollars was accompanied and followed by similar conversions of dollars into gold. The foreign exchange component of the world's monetary reserves was nearly wiped out in the process, except for the countries of the sterling area. Dollar balances — official and private — fell from $2.7 billion in 1929 to less than $0.4 billion at the end of 1933.

Substantial exchange losses were experienced at that time, and once again in 1949, particularly by sterling holders. Some of the central banks concerned were reimbursed by special legislation, but saw their management sharply criticized in the course of the parliamentary debates to which this gave rise. This experience has not been forgotten and is likely to act as a brake on further accumulation of foreign exchange reserves beyond the swollen levels which they have already reached. Any drop in the interest rates available on such short term balances, or any impairment of confidence in the future stability of the center countries' currencies, would slow down further the accumulation of foreign exchange balances by central banks, and might even stimulate substantial conversions of existing balances into gold.

It seems most unlikely, therefore, that the growth of dollar or sterling balances can provide a lasting solution to the inadequacy of gold production to satisfy prospective requirements for international liquidity in an expanding world economy. The problem has been postponed in this manner after World War II, exactly as it was after World War I. Time, however, is running short, and

the danger is increasing daily that further inaction and complacency may lead to a repetition, in a different form, of the 1931 collapse of the gold exchange standard.

Before coming to such a conclusion, however, we should now turn to a brief examination of the reserve position of the two center countries of the present international monetary system, *i.e.* the United Kingdom and the United States.

VI. The Position of the Center Countries

The United Kingdom and Its Sterling Balances.

Sterling balances made up, at the end of the war, the overwhelming bulk of official foreign exchange holdings. They reached, according to the Fund's estimates (33), the equivalent of $12.1 billion at the end of 1947, *i.e.* 88 per cent of total official foreign exchange balances, as against 12 per cent for official dollar balances.

Total sterling balances, official and private, exceeded $14 billion, *i.e.* about 288 per cent of the United Kingdom's annual exports. Such huge balances would not, of course, have been accumulated during the war, and retained after the war, without a considerable element of compulsion. Large amounts of them were blocked by British regulations, and other holdings were subject to various degrees of restrictions on their use, ranging from full convertibility — but at the cost of severe import restrictions — for the insignificantly low balances held in the dollar area, to purely bilateral accounts in the case of countries outside the sterling and the transferable area systems.

The dismal failure of the brief 1947 convertibility experiment amply demonstrated the need for a substantial reduction — rather than further expansion — of sterling balances. The spectacular progress achieved in this direction in the following ten years was

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(33) See, however, p. 21 above. Official sterling holdings at the end of 1945 were reported in *Economic Trends* (May 1958, p. viii) as equivalent to about $11 billion inclusive of British colonies, and $10 billion if colonies are excluded. No comparable figures are available for 1947. The total of sterling balances — official and private — declined only slightly — by about $280 million — between these two years, a total reduction of approximately $520 million in private and official holdings outside the British colonies being partly offset by the concomitant increase ($240 million) in colonial holdings.

a clear prerequisite for another, and less ephemeral, return to convertibility.

Measured in sterling terms, the overall reduction would seem very modest. Total non-territorial sterling balances fell only from 3.5 billion pounds in 1947 to about 3.1 billion pounds in September 1958. Moreover, a substantial portion of this decline is offset by increased sterling holdings of IMF and EPU, and by other short or medium term official British borrowings in the United States.

The improvement must indeed be measured in other ways. The actual burden of the sterling balances was, first of all, greatly reduced in dollar and in commodity terms by the sterling devaluation of 1949 and by a rise of more than 50 per cent in British export prices. The simultaneous expansion of nearly 80 per cent in export volume has also increased the normal demand for sterling balances. Thirdly, sterling balances held outside the sterling area have been more than halved, even in sterling terms, the largest part of this decline being accounted for, however, by a considerable increase in the more easily controllable holdings of colonial territories.

All in all, sterling balances today bear about the same relation to British exports as they did in 1938, and those held outside the sterling area represent only 20 per cent of annual imports, as against 44 per cent in 1938. Official balances of non-sterling countries were estimated in 1957 at less than $850 million, compared to more than $3.2 billion at the end of 1945.

Confidence in sterling has also increased considerably with other, and multiplying, signs of Britain's postwar recovery. The most striking of these are the increase in the United Kingdom's gold and dollar reserves since the end of 1957, and the large and growing surpluses on current account displayed by the balance of payments in 1957 ($0.9 billion) and in 1958 (more than $1 billion in the first half of the year only).

It is not unlikely, therefore, that the forthcoming months may witness a considerable demand for sterling balances by foreign countries. Sterling balances of non-sterling countries had indeed increased already by $325 million in the first nine months of 1958, previous to the convertibility decisions of the end of the year.

Further increases may be expected as a result of two features of the European Monetary Agreement which have not received all the attention which they deserve from economists and financial analysts. The first is that all OEEC countries are now free to accu-

TABLE XI

THE RESERVE POSITION OF THE CENTER COUNTRIES, 1928-1958

	1928	1932	1938	1947	1949	1953	1557	1958
I. *The United States*								
A. *Gold Reserves* ($billions)	4.1	4.0	14.6	22.9	24.6	22.1	22.9	20.6
B. *Dollar Balances* ($billions)	2.5	0.7	2.2	7.1	8.2	12.7	16.6	17.5
1. International	—	—	—	2.3	1.8	1.9	1.7	1.9
2. Countries:	2.5	0.7	2.2	4.9	6.4	10.8	14.9	15.6
a. Official			0.5	1.8	3.4	6.5	9.1	9.6
b. Private			1.7	3.0	3.1	4.4	5.7	5.9
C. *Ratio of Dollar Balances* (excl. Internat'l) *to U.S. Exports* (in per cent)	48	44	71	32	53	68	72	87
1. Official			16	12	28	41	44	54
2. Private			55	19	26	28	27	33
D. *Ratio of Total Dollar Balances to U.S. Gold Reserves* (in per cent)	61	17	15	31	33	57	72	85
II. *The United Kingdom*								
A. *Gold and Dollar Reserves* ($ billions)	0.7	0.6	2.9	2.2	1.8	2.5	2.4	3.1
B. *Sterling Balances* ($billions)	2.4	1.4	2.8	15.7	10.4	11.2	10.9	10.9
1. International	—	—	—	1.6	1.6	1.4	1.8	1.8
2. Countries	2.4	1.4	2.8	14.1	8.8	9.8	9.2	9.1
a. Colonies		0.7	1.6	1.9	1.5	3.1	2.5	2.4
b. Other Sterling Area				7.2	4.5	4.8	5.1	4.8
c. Non-Sterling Area		0.7	1.2	5.0	2.7	1.9	1.6	1.9
(1) OEEC				1.7	1.0	0.6	0.7	1.0
(2) Other				3.3	1.8	1.3	0.9	0.9
C. *Ratio of Sterling Balances* (excl. International) *to U.K. Exports* (in per cent)	69	108	104	288	127	131	94	97
1. Colonies		54	59	39	22	41	26	26
2. Other Sterling Area				147	65	64	53	51
3. Non-Sterling Area		54	44	102	39	25	16	20
a. OEEC				35	14	8	7	10
b. Other				67	25	17	9	10
D. *Ratio of Total Sterling Balances to U.K. Gold and Dollar Reserves*	320	240	95	705	595	440	460	355

Footnotes:

1. Official dollar balances include small amounts of "bonds and notes", reported only since 1949 and for which no breakdown is available between official and private holdings.

2. Sterling balance estimates for 1928 are from the (Macmillan) *Committee on Finance and Industry Report* (London, 1931), pp. 42 and 301. Those for 1932 are from the BIS study on *The Sterling Area* (Basle, 1953) and actually refer to the end of 1931. The 1938 estimate is taken from the *Twenty Second Annual Report* of the BIS (Basle, 1952), p. 172. These are probably fairly rough estimates, not fully comparable with postwar estimates as regularly published in *Economic Trends*.

3. Dollar balance estimates for the end of 1958 combine short-term liabilities as of the end of November with bonds and notes as of the end of September. Sterling balance estimates are as of the end of September.

mulate sterling reserves if they so wish, while they were debarred from doing this under the monthly compensation machinery of the EPU Agreement. The second is that such holdings will enjoy a firm exchange guarantee in terms of the U.S. dollar, under Article 11 of the European Monetary Agreement, while dollar holdings will not benefit from any similar guarantee in terms of sterling. Although any devaluation of the dollar with relation to sterling may now appear as a very remote and improbable contingency, this difference of treatment should not be entirely forgotten. More immediately significant, however, is the fact that European central banks are now free to accumulate sterling, if they so choose, without taking any exchange risk in the case of a devaluation of sterling with respect to the dollar. A substantial lowering of interest rates in New York compared to London might thus easily induce considerable shifts of short-term balances from dollar to sterling assets.

In spite of this, little reliance should be placed on the future growth of sterling balances to fill the prospective gap between gold production and world reserve requirements.

The main reason for this is that gross British reserves are still very low in relation to short-term sterling liabilities. The difficulties repeatedly encountered by Britain for that very reason, in 1931, 1947, 1949, 1951, 1953 and 1957 are likely to induce her to match any increase in sterling balances by equivalent, or more than equivalent, increases in her own reserve assets. Little net additions to world liquidity should, therefore, be expected from this source.

The United States and Its Dollar Balances.

The prospective growth of dollar balances offers, at first view, more promising possibilities. In spite of their enormous increase since the war, dollar balances still do not appear excessive in relation to United States exports. The ratio of the first to the latter (87 per cent) is only slightly larger than in 1938, and still well below the corresponding ratio for the United Kingdom (97 per cent). In sharp contrast to the British case, moreover, our gold stock is still substantially larger than our total short-term liabilities abroad.

It is indeed the persistent decline in our net reserve position which has been, by far, the major source of supply for the very

satisfactory growth of other countries' reserves since 1949 (34). This fact received little public notice as long as the drain on our reserves took the form of an increase in our short-term dollar liabilities abroad rather than in a loss of gold from Fort Knox. From 1949 to the end of 1957, our gold stock decreased only by $1.7 billion, or about 7 per cent, while our dollar liabilities more than doubled, from $8.2 billion to $16.6 billion.

This rapid growth of dollar balances during the postwar years reflected, at least in part, the substitution of convertible dollars for inconvertible sterling in world settlements and world reserves. This throws further doubt on the likelihood of any continued and indefinite accumulation of dollar balances abroad on a scale comparable to that experienced during the last decade. The prediction which I had ventured in this respect in the spring of 1957 (35) seemed to find some confirmation in 1958. In the first nine months of that year, foreign countries' short-term dollar holdings — including bonds and notes — rose by less than $300 million, while net gold purchases from the United States totalled $1.900 million, and climbed further to $2,300 million by the end of the year.

The United States gold losses of 1958 are beginning to create some concern about the continued deterioration in the country's net reserve position. The excess of gold reserves over short-term liabilities to foreign countries — including bonds and notes — has declined continually from $18.2 billion at the end of 1949 to $5.8 billion in September 1958, *i.e.* at an annual rate of more than $1.3 billion over the years 1950-1957, and of nearly $3 billion during the first nine months of 1958.

Such a movement obviouslv could not continue indefinitely without ultimately undermining foreigners' confidence in the dollar as a safe medium for reserve accumulation. The time will certainly come, sooner or later, when further accumulation of short-term foreign liabilities will either have to be slowed down or substantially matched by corresponding increases in our already bloated gold assets. If this were not done on our own initiative, foreign central banks would do it for us by stopping their own accumulation of dollar assets and requiring gold payment instead for their overall surplus with the United States.

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(34) See above, pp. 38-39 and Table IX.

(35) *Europe and the Money Muddle*, Yale University Press, 1957, p. 297.

As in the case of sterling balances, therefore, further increases in dollar balances cannot be relied upon to contribute substantially and indefinitely to the solution of the world illiquidity problem.

VII. The Gold Exchange Standard

Before discussing other possible remedies, it may be advisable to broaden our understanding of the problem by inserting it into a larger historical context. The problem indeed is not new, although it has manifested itself in many different forms in past history, and been solved in a great variety of ways.

It is not necessary to accept any rigid version of the quantity theory of money to recognize that some link has always existed between monetary expansion and economic growth. The link is a loose one, and does not in any way imply a simple causal relationship. Monetary expansion will not automatically ensure economic growth. It may, however, stimulate it. What is even clearer, and more relevant to the present discussion, is that economic growth is almost certain to be arrested or slowed down at some point if the way cannot be found to ensure a parallel — although by no means proportionate — increase in monetary liquidity.

Previous to the large-scale development of banking institutions in the nineteenth century, gold and silver remained for many centuries the main source of supply of new money in the West. Their relative abundance or scarcity could not fail to play an important — although neither decisive nor exclusive — role in the evolution of prices and of economic activity. Every economic historian has stressed, for instance, the impact exercized in this respect by the influx of gold and silver into Spain and into Europe following the discovery of America. Long waves of economic activity in the nineteenth century — the so-called Kondratieff cycles — have similarly been related by many economists to the uneven pace of gold discoveries and production. Economists, however, are prone to stress the originality, rather than the conformism, of their views, and to emphasize the differences of interpretation that distinguish them from their colleagues, rather than the common ground on which they would all meet. Their basic agreement on the points mentioned above is thus often veiled by controversies over the relative weight to be given, in the analysis of events, to monetary

and real factors and over the "causal" direction which runs between the first and the latter. We are here, however, looking at the forest rather than at the trees, and these differences do not invalidate the broad conclusion that a lag in monetary expansion may act at times — and often has acted in the past — as a brake on the rate of economic development.

For many centuries, the repeated debasement of coinage constituted the main escape from the difficulties resulting from the failure of gold and silver supplies to keep pace with the monetary needs of individual countries (36). The stability exhibited by the major Western currencies with respect to gold throughout the nineteenth century was unprecedented in history. It was largely the product of an enormous expansion in gold production and of the large-scale development of paper currency and deposit-money as adjuncts to gold and silver in monetary transactions.

These new forms of money, however, were now national, rather than international, and the maintenance of exchange rate stability became dependent on their convertibility into internationally acceptable money by the issuing institution. The incidence of this on the problem of international reserves has already been traced in the earlier sections of this study. All that we need observe at this stage is the economy in the use of scarce gold supplies which was effected by the gradual shift of gold coin from circulation in the public to the reserves of the banking system and, later on, from private circulation and bank reserves to the reserves of a single national institution, *i.e.* the Treasury or Central Bank. The latter phenomenon was one of the three major remedies applied to the shortage of gold reserves in relation to the vastly expanded circulation of national paper money and bank deposits during and after the first world war. Gold reserves nearly doubled between 1913 and 1928, passing from $4.9 to $10.0 billion — including Russian gold — but of this total increase of $5.1 billion less than half ($2.3 billion) was derived from the excess of new gold production over non-monetary absorption, and about 55 per cent ($2.8 billion) from the contraction of monetary gold outside Treasuries and Central Banks.

(36) The gold content of the French "livre tournois" gradually fell, for instance, from about 3.2 grams of fine gold in 1351 to 0.29 grams in 1795, *i.e.* a debasement of more than 90 per cent. The fine gold content of British coinage fell somewhat less, by 77 per cent, between 1257 and 1816.

The second remedy lay in the drastic devaluation of many currencies with respect to gold, and to the consequent revaluation of gold reserves in terms of national currencies.

These two categories of measures did not succeed in restoring fully the prewar proportion of gold reserves to the currency issues and other sight liabilities of central banks. The ratio of the first to the latter dropped from 48 per cent in 1913 to about 40 per cent in the late 1920's (37).

The third remedy resorted to during this period was, as already noted in previous sections of this paper, a much wider reliance on national key currencies — primarily sterling and dollars — as additional components of world monetary reserves. By combining the above estimates with the IMF estimates of foreign exchange reserves ($500 million in 1913 and $3,250 million in 1928) one arrives at a ratio of total reserves to sight liabilities of 53 to 54 per cent, both in 1913 and 1928.

Such world averages, however, concealed wide variations in the reserve position of individual countries. Approximately half of the world's reserves were concentrated in 1928 in two countries only, France and the United States, while the gold reserves of the Bank of England ($750 million) were less than a fourth of sterling deposits and bills held or accepted in London on foreign account (38).

The increasing use of foreign exchange balances as a remedy to world illiquidity under the new gold exchange standard had thus fatally weakened the reserve position of the country on which the system was primarily dependent for its continued operation. The collapse of the major key currency of the system in 1931 inevitably sucked other currencies in the whirlpool, and entailed the temporary breakdown, not only of sterling, but of the international monetary system itself.

An unprecedented degree of international liquidity was nevertheless reached in the 1930's, in spite of the near-disappearance of the foreign exchange component of world reserves. This, however,

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(37) *Interim Report of the Gold Delegation of the Financial Committee* (League of Nations, Geneva, 1930), p. 94.

(38) Expressed in pounds sterling, the gold reserves of the Bank of England at the end of 1928 were about £154 million. Deposits and sterling bills held in London on foreign account — including advances to the discount market — totalled £500 million. Acceptances on foreign account totalled another £200 million. See the (Macmillan) *Committee on Finance and Industry Report*, London, 1931, p. 301.

came as the by-product of widespread currency devaluation and, most of all, of a drastic and prolonged contraction in the volume and value of world trade. Deflation, devaluation and restrictions were the three sources of the unwanted levels of international monetary liquidity of the 1930's. They also reflected, at least in part, the vulnerability imparted by the gold *exchange* standard to the monetary centers of the system and transmitted through them to the world monetary system itself.

The basic absurdity of the gold exchange standard is that it makes the *international* monetary system higly dependent on individual countries' decisions about the continued use of one or a few *national* currencies as monetary reserves. In the absence of any widespread doubts about exchange rate stability, the choice of such currencies as reserves normally falls on the currencies of the countries which play a major role in world trade and finance. Sterling, the dollar and, subsidiarily, the French franc thus became the main reserve currencies in the 1920's. When doubts about the future stability of exchange rates begin to develop, however, the weaker currencies quickly tend to be eliminated from this competition, and the choice of reserve currencies narrows down to the strongest, hardest, and thus safest, currencies in world trade and settlements. When even these begin to be questioned, a further shift to gold may bring the gold exchange standard to an end and move the world back toward the previous gold, or gold bullion, standard.

The gold exchange standard *may*, but *does not necessarily*, help in relieving a shortage of world monetary reserves. It does so only to the extent that the key currency countries are willing to let their *net reserve* position decline through increases in their short-term monetary liabilities unmatched by corresponding increases in their own gross reserves. If they allow this to happen, however, and to continue indefinitely, they tend to bring about a collapse of the system itself through the gradual weakening of foreigners' confidence in the key currencies.

This happened to the United Kingdom in 1931. The collapse was then brought about by large shifts of sterling balances into gold and dollars, leading to the devaluation of sterling. It happened again as a consequence of wartime developments and resulted then both in the 1949 devaluation and in the protracted inconvertibility of sterling and recurring balance of payments crises of Britain throughout the postwar years.

This explains the division of views which has developed in recent years in the United Kingdom about the relative advantages and disadvantages flowing to its own economy from the wide use of sterling as an international currency (39). It may also help explain why other countries, such as Switzerland and Germany, have tried so far to discourage, rather than welcome, the use of their national currency as international reserves.

The weakening of the sterling position, and of other major world currencies, after World War II concentrated the choice of all countries upon the United States dollar as the hardest, and thus safest, medium for the investment of their foreign exchange reserves. It brought coal to Newcastle in the form of " unrequited " lending by the rest of the world to the main creditor country. This added to the difficulties which the United States already confronted in developing a sufficient level of *net* capital exports to finance its large surpluses on current account and avoid an aggravation of the dollar shortage.

To the extent that we succeeded in doing this, however, we also tended, inevitably, to adjust our overall balance of payments on current and U.S. capital account — including official grants and loans — to the persistent inflow of foreign short-term balances into our market, and to weaken correspondingly our net reserve position to a point beyond which neither we, nor probably foreign countries, would wish to venture much further. As we have already seen, the mere slowdown of this foreign capital inflow resulted in 1958 in a relatively large gold outflow. If the latter persists, or reasserts itself at a later date, we shall have to undertake some complex readjustments in our economic policies, in order to restore long-run equilibrium in our international transactions.

The relatively small role of external transactions in relation to GNP, and the enormous strength and resiliency of our economy, should facilitate these necessary readjustments, and rule out difficulties of the kind previously encountered by Britain. Only an incredible complacency on our part could bring us to the point where the weakening of our reserve position might finally stimulate massive conversions of foreign countries' existing dollar balances into gold, and force us to suspend or modify the legal gold cover requirements of the Federal Reserve System. Even this could, in

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(39) See particularly A. C. L. Day, *The Future of Sterling*, Oxford Press, 1958.

any case, be done easily if economic considerations did not risk, at that stage, to be overshadowed by irrational, but powerful, psychological and political forces. Is it too fanciful to imagine that the Daughters of the American Revolution might then clamor for an embargo on gold sales or shipments abroad, and that the threat of any such action might precipitate the conversion of existing dollar balances into gold and force the authorities to resort to such drastic measures, no matter how unnecessary these would have been in a calmer environment? A gold embargo would, however, entail nearly inevitably — even if only temporarily — a *de facto* depreciation of the dollar with respect to gold. Other currencies would probably find themselves involved in the process, as any expectations of a dollar depreciation in relation to gold would almost certainly be accompanied by expectations of a similar depreciation of other currencies, and would prompt legal or illegal flights into gold or real assets, abroad even more than in the United States.

I do not wish to suggest that such dramatic developments are in the least probable. They are, on the contrary, totally unlikely to occur. The United States authorities are well aware of the problem and determined to tackle it long before the danger point is reached. The real danger which we face is not that of a dollar collapse. It is the fact that such a collapse can ultimately be avoided only through a substantial slowdown of the contributions to world liquidity derived in the last nine years from the persistent weakening of our net reserve position. The solution of the dollar problem will thus involve a reopening or aggravation of the world liquidity problem.

VIII. Summary and Conclusions

The world's normal requirements for monetary reserves appropriate to the maintenance of convertibility by major trading countries are likely to exceed considerably — by $5 billion to $15 billion — over the next ten years the contribution which may be expected for that purpose from current levels of gold production (40).

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(40) Including about $200 million a year of Russian gold sales to the West. The conclusions of this paper would, I must admit, be thoroughly upset if the USSR decided to use aggressively its vast gold stock in world markets, for economic or political purposes. Depending on the policies adopted on both sides of the famed iron curtain, this could either save or definitely wreck the gold standard as an international monetary mechanism.

This gap is unlikely to be filled by the supplementary contributions to world liquidity that may be derived from the further growth of dollar, sterling, and other national currency balances as media for reserve accumulation.

In the absence of any specific planning and policies, the growing inadequacy of world reserves would be most likely to lead, within a relatively short span of years, to a new cycle of international deflation, devaluation and restrictions, as it did after 1929. Such a cycle might possibly be triggered off by unfavourable economic developments outside the center countries themselves, but its international spread would begin with the difficulties which the United States or the United Kingdom might experience as a result of any considerable slowdown or reversal of the inflow of foreign funds to their markets. The lessons of the 1930's and the radical changes which have taken place since then in governmental attitudes and policies would probably rule out any widespread recourse to, or acceptance of, internal deflation as a method of adjustment. Devaluation and restrictions would be the most likely outcome of such a situation.

Fortunately, a sufficient number of people are now alert to these dangers, and we have witnessed during the last year some modest beginnings toward advance planning in this field. The proposed expansion of the International Monetary Fund's quotas by 50 per cent, and of the International Bank's capital by 100 per cent are steps in the right direction. A less publicized, but important feature of the European Monetary Agreement is the exchange guarantee provided by it on all balances held by any participating country in the currency of any other participating country. This provision may indeed encourage a broader use of European currencies — and particularly sterling — as reserves by the countries concerned. Finally, the implementation of the provisions of the European Economic Community Treaty relating to coordination of economic and monetary policies and the adjustment of balances of payments within the Community may also lead to fruitful developments in the future.

Far more comprehensive measures than those adopted so far remain necessary, however, to adapt the old gold and gold exchange standards to the needs of our times and to provide the world with a viable framework for international payments in an expanding world economy. The most promising line of approach to a long-

term solution of the problem lies in the true "internationalization" of the foreign exchange component of the world's international reserves, protecting the world monetary system from the instability resulting from arbitrary shifts from one reserve currency into another or into gold. Such a solution should be regarded as the normal culmination of one of the techniques used in the past to adjust the monetary system to the requirements of an expanding economy, *i.e.* the gradual withdrawal of gold coin from active circulation, and its concentration into the monetary reserves of national central banks. Its adoption can also develop only gradually at best, and premature or overambitious plans such as embodied in Keynes' famous *Proposals for an International Clearing Union* would be doomed to failure today, as they were in 1943.

It is to be hoped, however, that more modest and feasible agreements may prove negotiable in time, both regionally and internationally. Three institutions should normally take the lead in this respect: the European Economic Community, the Organization for European Economic Cooperation, and the International Monetary Fund. The possible scope and line of action of each will be discussed in a forthcoming article in this Review.

Yale University ROBERT TRIFFIN

APPE

BASIC ESTIMATES FOR RESERVE

(in billions of

	1913			1928			1932	1937	1938
	Reserves	Gold Circulation	Total	Reserves	Gold Circulation	Total			
I. *Gold*	4.03	3.57	7.60	9.76	1.04	10.80	11.35	25.31	25.95
A. United States	1.29	0.63	1.92	3.75	0.40	4.15	4.05	12.79	14.59
B. Other	2.74	2.93	5.68	6.01	0.64	6.65	7.30	12.52	11.36
1. United Kingdom	0.17	0.60	0.77	0.75	0.09	0.84	0.58	4.14	2.88
2. Other	2.58	2.33	4.91	5.26	0.55	5.81	6.72	8.38	8.48
II. *Foreign Exchange*	0.50			3.25			1.00	2.26	1.80
A. United Kingdom	—			—			—	—	—
1. Dollar	—			—			—	—	—
2. EPU-BIS	—			—			—	—	—
3. Discrepancy	—			—			—	—	—
B. Other	0.50			3.25			1.00	2.26	1.80
1. Dollar									0.50
2. Sterling									1.30
3. EPU-BIS									
4. Discrepancy									
III. *Total*	4.53	3.57	8.10	13.01	1.04	14.05	12.35	27.57	27.75
A. United States	1.29	0.63	1.92	3.75	0.40	4.15	4.05	12.79	14.59
B. Other	3.24	2.93	6.18	9.26	0.64	9.90	8.30	14.78	13.16
1. United Kingdom	0.17	0.60	0.77	0.75	0.09	0.84	0.58	4.14	2.88
2. Other	3.08	2.33	5.41	8.51	0.55	9.06	7.72	10.64	10.28
IV. *Imports*			21.0			30.6	12.71	27.62	23.54
A. United States			1.8			4.4	1.34	3.57	2.46
B. Other			19.2			26.2	11.37	24.05	21.07
1. United Kingdom			3.7			5.8	2.28	5.08	4.50
2. Other			15.5			20.4	9.09	18.97	16.57
V. *Gross Reserve Ratio* (%)	22	17	39	43	3	46	97	100	118
A. United States	72	35	107	85	9	94	302	358	592
B. Other	17	15	32	35	2	38	73	61	62
1. United Kingdom	5	16	21	13	1	14	26	81	64
2. Other	20	15	35	42	3	44	85	55	62

Sources and Footnotes:

1. Most of these estimates are derived from IMF gold, foreign exchange, and trade statistics, and exclude International Organizations and the Soviet Area countries.

International Financial Statistics' most recent (February 1959) Tables have been used for the years 1937 and 1950-1957; Appendix Table 3 of *International Reserves and Liquidity* for foreign exchange estimates for the years 1947-1949; and Appendix Table 2 of the same study for gold estimates for 1947-1949, and for both gold and foreign exchange estimates for 1938.

2. Other sources were used to check and complete the estimates for 1913, 1928, and particularly 1932. Preference was given for this purpose to the gold reserve statistics of the

NDIX

CALCULATIONS, 1913-1957

U.S. dollars)

1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
32.40	32.75	33.15	33.83	33.94	33.94	34.37	34.98	35.46	36.10	37.36
22.87	24.40	24.56	22.82	22.87	23.25	22.09	21.79	21.75	22.06	22.86
9.53	8.35	8.59	11.01	11.07	10.64	12.28	13.19	13.71	14.04	14.50
2.02	1.60	1.35	2.90	2.20	1.50	2.30	2.55	2.05	1.80	1.60
7.51	6.75	7.24	8.11	8.87	9.19	9.98	10.64	11.66	12.24	12.90
13.90	13.90	10.85	13.70	13.15	13.58	14.62	15.55	16.02	16.70	16.24
0.21	0.40	0.40	0.77	0.17	0.46	0.25	0.25	0.11	0.37	0.77
0.06	0.25	0.34	0.40	0.13	0.35	0.22	0.21	0.07	0.33	0.67
—	—	—	0.23	—	—	—	—	—	—	—
0.15	0.15	0.06	0.14	0.04	0.11	0.03	0.04	0.04	0.04	0.10
13.69	13.50	10.45	12.93	12.98	13.12	14.37	15.30	15.91	16.33	15.47
1.79	2.65	2.71	4.05	3.91	4.90	5.83	6.84	7.80	8.22	7.53
12.15	10.77	7.41	7.78	7.65	6.33	6.83	6.98	6.59	6.22	5.84
—	0.05	0.11	0.43	0.86	1.44	1.62	1.57	1.41	1.51	1.68
−0.25	0.02	0.21	0.67	0.56	0.45	0.09	−0.19	0.11	0.38	0.43
46.30	46.65	44.00	47.53	47.09	47.53	49.00	50.53	51.48	52.80	53.60
22.87	24.40	24.56	22.82	22.87	23.25	22.09	21.79	21.75	22.06	22.86
23.43	22.25	19.44	24.71	24.22	24.28	26.91	28.74	29.73	30.74	30.74
2.23	2.01	1.75	3.67	2.37	1.96	2.55	2.80	2.16	2.17	2.37
21.20	20.24	17.69	21.04	21.85	22.32	24.36	25.94	27.57	28.57	28.37
53.30	60.05	59.91	59.34	81.40	80.20	76.57	79.61	88.98	98.21	107.39
6.55	8.06	7.53	9.60	11.88	11.66	11.79	11.05	12.37	13.80	14.17
46.76	52.00	52.38	49.74	69.52	68.53	64.78	68.56	76.61	84.41	93.22
7.34	8.37	8.52	7.31	10.93	9.74	9.36	9.45	10.87	10.88	11.41
39.42	43.63	43.86	42.43	58.58	58.80	55.42	59.11	65.74	73.53	81.80
87	78	73	80	58	59	64	63	58	54	50
349	303	326	238	193	199	187	197	176	160	161
50	43	37	50	35	35	42	42	39	36	33
30	24	21	50	22	20	27	30	20	20	21
54	46	40	50	37	38	44	44	42	39	35

Federal Reserve *Banking and Monetary Statistics* (Washington, 1943), pp. 544-555, and to the estimates of gold circulation of the *Gold Delegation of the Financial Committee of the League of Nations* (1930 *Interim Report*, pp. 114-117 for 1913, and the 1932 *Report*, pp. 78-83 for 1928). Foreign exchange estimates for 1932 had to be pieced together from other League of Nations publications (particularly Ragnar Nurkse's *International Currency Experience*, League of Nations, 1944) and can only be regarded as a rough approximation.

3. Slight differences in the inclusiveness of estimates covering such an extended period of time are well-nigh unavoidable and introduce a corresponding margin of error in all calculations based on this Table, particularly for the years 1913-1949.

Economic Growth in Western Europe
1870-1957 (*)

In the post-war years there has undoubtedly been very great economic progress in Western Europe. Output and productivity have risen very fast, investment has been high, employment has been at very high levels, and although we shall not be analysing them in this article, trade has risen faster and growth has proceeded with much less interference from periodic waves of recession than was the case historically. The purpose of this study is to try to put the post-war experience into historical perspective in order to provide some criteria for measuring post-war performance, and also to find out whether the nature of economic growth in the Western economies has been transformed, or whether the achievements of the past decade are due to special, and perhaps temporary, circumstances connected with recovery from war and the great depression of the 1930s.

The study arose from attempts by the author to make long-term forecasts of economic growth for European countries, in which many unanswered questions arise. What has been the "normal" rate of growth of output and productivity in Europe, excluding times of war and major recession? What degree of recovery or abnormality has there been in post-war rates of growth? What is the normal capital-output ratio, or the ratio of investment to output? For the U.S., the answers to these questions are much easier, not only because there are more statistics, but because the experience of growth has been interrupted only once in this century — by the Great Depression. In Europe, the statistical information for any one country is not as good as in the U.S.

(*) This article was made possible by the award to the author of a NATO research fellowship. I am indebted to my colleague Olaf Saetersdal for advice on the adjustments which I have made to the historical figures of GNP.

for the past 50 years, but by collecting the best available data for several European countries, analogies can be found which are useful for analysing the past or forecasting the future of any one of them. Such a study should also be useful in throwing up any inconsistencies or errors in the original data, for an estimate of output or productivity which may be plausible for one country might be questioned when compared with divergent developments in a neighbouring country with similar resource endowments, factor costs, social institutions, rates of investment and political structure.

Output

In this article, we have chosen GNP as our measure of output because it is a more embracing concept than the other main measure available — industrial production — and thus reflects better the output of the whole community. Industrial production would give too optimistic a picture of growth in societies which have been steadily increasing their degree of industrialisation. It is also necessary in the analysis of economic growth to examine other significant variables which are only available on an aggregative basis — such as the labour force, the rate of investment, or the capital stock. Furthermore, there is now some agreement in Europe as to how to define Gross National Product, thanks to the efforts of the OEEC, and there are reasonable historical estimates available for Denmark, Germany, Italy, Netherlands, Norway, Sweden and the U.K. which we have adjusted to make as comparable in concept as possible (1).

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(1) COLIN CLARK, in his third edition of *Conditions of Economic Progress*, presents estimates for several other European countries as well. However, Clark was interested in bolder and more global comparisons than we are. Some of his time series are simply a collection of unrelated estimates for different years for which there is no link, but for which he has been able to find some indicator of the purchasing power of the currency. We have not accepted any estimate which is not based on a continuous series, or linked any series for which there is no satisfactory overlap. It is difficult to judge the validity of some of Clark's figures in some cases where sources are not given. Professor KUZNETS', *Economic Development and Cultural Change*, Vo. V, No. 1, October 1956, has estimates for France, Ireland and Switzerland as well as the countries covered here, but the figures for the latter two countries are derived from Clark, and for France partially from Clark. His other GNP sources are mostly the same as ours. It is a pity that our sample does not include France for which the lack of production censuses, an aversion to taxation and chronic inflation, seem to have so far impeded any reasonable estimates in constant prices.

Unfortunately, the sources of data for estimates of GNP vary considerably from country to country, and methods of correction for price changes have varied too. The choice of different periods as a weighting base can also affect significantly the quantitative developments. However, there is little that can be done by the lone investigator to unscramble the weighting systems to make them reasonably uniform (2), because many of the price indices which are published as having the weights of a certain year, have, in fact, simply been rebased on that year. So that references to "prices of 1913, 1929" etc. often do not really represent the price relationships of those years at all. For the future, we can hope for better things as there are some hopes that deflation procedures may be standardised just as the definitions of product have been (3).

Our output figures start from 1870 and run to 1957, a period of 87 years, which we have divided into two equal periods by taking 1913 as our base year. 1870 is a good year to start because it follows the unification of Germany and Italy, and the American civil war, and was the beginning of a long period during which the production and trade of the major industrial powers was not interrupted by war. The (unweighted) average growth for this period was 2.5 per cent a year, with Denmark, Germany, Sweden, well above average at 3.1 per cent, and Italy lagging well behind at 1.4 per cent. 1913 is a good turning point because it was the beginning of a period of war, major economic disturbance, and important changes in demographic structure. Over the period 1913-1929 as a whole, output grew more slowly than before the war — although expansion was generally fast in the late 1920s. During the depression period of 1929-38, the rate of growth was, surprisingly, higher than from 1913 to 1929 in all countries except Italy and the Netherlands.

1938 is a reasonable benchmark to take in measuring achievements since pre-world war II, because it was generally the peak pre-war year (4). From 1938 to 1957, the rate of GNP increase has averaged 2.6 per cent in our seven countries, *i.e.* considerably

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(2) As has been done for industrial production for OEEC countries, cf. *Industrial Statistics 1900-1957*, OEEC, Paris, 1958.

(3) Cf. Richard Stone, *Quantity and Price Indexes in National Accounts*, OEEC, Paris, 1956.

(4) 1937 was fractionally higher in Denmark, Italy and the Netherlands.

TABLE 1

RATES OF GROWTH OF GNP (1)

	Denmark	Germany	Italy	Nether-lands	Norway	Sweden	United Kingdom
1870–1913	3.1	3.1 (2)	1.4	2.2 (3)	2.6 (3)	3.1	2.3
1913–1957	2.2	2.0	2.0	2.5	2.8	2.4	1.6
1913–1929	2.1	0.5	1.8	3.3	2.8	1.6	1.3
1929–1938	2.2	2.5	1.6	0.1	3.0	2.0	2.2
1938–1957	2.3	2.9	2.3	3.1	2.8	3.3	1.6
1924–1929	2.7	3.5 (4)	2.6	4.2	4.2	4.3	2.9
1951–1957	2.7	7.5	5.4	5.2	3.6	3.8	2.5

(1) This table and the following tables in the text are derived from the tables in the statistical annex.

(2) 1871-1913.

(3) 1900-1913.

(4) 1925-1929.

Figures adjusted to exclude the effect of changes in national boundaries. Cf. Table I of annex and notes.

better than in the previous period of war and recovery from 1913-1929. If we compare post-war experience since 1951, we find that the average rate of growth has been 4.4 per cent, which compares well with the similar period of prosperity from 1924 to 1929 when growth averaged 3.5 per cent.

Thus, we can conclude that the recovery from wartime losses was very good considering the length of the war and the extent of post-war dislocation. It also seems that the post-war rate of growth has been very satisfying in historical perspective, but, in the light of experience in the 1920s, it does not seem to be without parallel. As one must suspect that there were large elements of recovery in the period from 1951, it would be difficult to claim that the last row in Table 1 is any measure of a new long-run trend. It is necessary to analyse the reasons for increased output in more detail in order to appreciate the nature of the gains which have been made. We shall try in the following sections to see how output has been influenced by changes in the labour supply and its productivity, and then by investment and its productivity.

Labour Supply

(a) *Population.*

From 1913 to 1938, the rate of population growth fell in most of our countries because of falling birthrates. Since 1938, birthrates have risen again and the rate of population growth has increased. In Germany the sharp rise has been due almost entirely to immigration.

POPULATION GROWTH — TABLE 2

	Denmark	Germany	Italy	Netherlands	Norway	Sweden	United Kingdom
1870 - 1913	1.1	1.1 (1)	0.7	1.4 (2)	0.7 (2)	0.7	0.9
1913 - 1938	0.9	0.5	0.6	1.4	0.7	0.5	0.4
1938 - 1957	0.9	1.4	0.7	1.3	0.9	0.8	0.4

(1) 1871-1913.
(2) 1900-1913.

TABLE 3

POPULATION OF WORKING AGE AS A PERCENTAGE OF POPULATION

	Denmark	Germany	Italy	Netherlands	Norway	Sweden	United Kingdom
1870	60.8	61.2 (1)	61.7	59.0 (2)	56.5 (2)	60.5	58.9 (1)
1913	60.2	63.1	60.3	60.1	57.9	60.6	64.1
1938	67.0	68.1	62.5	64.8	64.3	69.3	69.4
1957	63.3	69.1	66.6	61.4	63.1	65.1	65.2

(1) 1871.
(2) 1900.

As far as production is concerned, the movement in the population of working age, *i.e.* aged 15-64, is of more importance than movements in total population, for it is the principal determinant of the labour supply (5). From 1870 to 1913, there was little change in the age structure of the population, except in the U.K. where the

(5) In nearly all our countries, well over 95 per cent of the labour force is aged between 15 and 64.

proportion of working age rose substantially. From 1913 to 1938, there were substantial increases in the relative size of the working age population in all countries, due to the fall in birth rates and the rise in life expectation. Since 1938, this tendency has been generally reversed, except in Germany and Italy, because birth rates have risen again, and the increase in life expectation has had its chief impact on those who have already passed working age.

(b) *Labour Force.*

There are no official estimates of the labour force for European countries for the years before the war, and, indeed, even for the post-war period estimates are often lacking. The main pre-war source of information of the working population is the population census, and in several countries difficulties arise because the definition of economic activity changed from one census to another.

In the United States, where more work has been done on the measurement of the labour force than in any European country, it has been observed that the labour force has been a remarkably stable proportion of the total population of working age, although this long-term stability concealed some compensating variations for different groups of the population — a fall in the activity of juveniles and old people compensated by a rise in female activity. A recent American study has suggested that stability of activity rates may be a fairly general international phenomenon (6).

Insofar as the census material is a reliable guide, it does seem that the labour force has been a reasonably stable proportion of the working population in the last forty years or so in Europe, although there has been a slight tendency to a decline because of increased school attendance by young people, and, in some cases, reduced activity of females. Since 1950, however, thit decline has been checked, and in Germany and the U.K. substantially reversed, because the buoyant level of demand has attracted more women into the labour force.

In the case of Italy, however, the long-term decline in the activity rate has been very substantial due to the decline in the

(6) Clarence D. Long, *The Labor Force under Changing Income and Employment*, NBER, 1958. Professor Long finds a fair degree of stability for Australia, Canada, Great Britain, New Zealand, as well as for the U.S.

activity of juveniles and women. There were also erratic movements in activity rates from 1913 to 1929 in Denmark and Sweden, probably due to changes in census definitions. Several observers have commented on the difficulty of measurement created by changing census definitions of the occupied population, and some of them have attempted to correct for this.

TABLE 4

LABOUR FORCE AS A PERCENTAGE OF POPULATION OF WORKING AGE (1)

	Denmark	Germany	Italy	Nether-lands	Norway	Sweden	United Kingdom
1913	73.2	74.7	79.0	64.9	67.7	68.9	70.0
1929	68.4	73.4	73.1	63.5	65.5	71.7	68.6
1938	74.7	74.3	69.8	63.3	64.9	68.0	68.9
1950	74.5	68.9	64.1	61.2	64.2	66.5	69.4
1957	74.4	72.4	63.9	62.6	64.8	66.5	72.0

(1) *i.e.* total labour force of all ages as a ratio of population aged 15-64. The above figures are for our benchmark years and are generally interpolations between census years with the exception of 1950. The ratios for census years are cited in our statistical annex.

In order to avoid some of these difficulties, Colin Clark has excluded all women engaged in agriculture and fishing from his estimates of the labour force (7). This is probably an improvement if one wants to compare activity rates between countries as he does, for there are big discrepancies between countries in the census treatment of family workers in agriculture. However, this adjustment will not necessarily improve the estimates of the movement of the labour force over time for any one country. It totally excludes a portion of the labour force which does make some contribution to output but which is likely to be declining in relative importance over time, and hence the residual labour force figure will have an upward bias over time. There are also other problems apart from agricultural women which detract from the value of

(7) *Conditions of Economic Progress*, Third Edition, p. 496.

census data for long-term or inter-country comparison, *e.g.* the vagaries in the measurement of juvenile employment. In some countries, the occupied population by definition now excludes juveniles under 15, and this is rather a good practice as children are rather ineffective members of the labour force and are often in part-time jobs in any case. However, the age limit for census purposes has varied over time, and from country to country.

In most nineteenth century censuses and in all the Italian censuses, children aged 10 and over were included as members of the labour force. There is no doubt that these children did have some impact on output, but if they are included in the labour force it is desirable to give some lesser weight to their contribution than to that of adults. Rather than embark on this exercise which would lead logically to manifold adjustment coefficients for different kinds of part-time labour, it would be preferable to ignore the contribution of those aged less than 15. An even simpler hypothesis in doubtful cases is to assume that the activity rate has been stable and that the labour force has moved parallel with the population of working age (8). We have made this assumption for the period before 1913 when the variations between successive censuses were probably greater than they have been since (9), and it may for some purposes be preferable to make the same assumption for Italy throughout.

(c) *Unemployment.*

Figures on unemployment are not very comparable over time as methods of registering unemployment have changed considerably. Nevertheless, we have tried to introduce some degree of comparability into the figures by correcting them for their degree of coverage, and certain broad conclusions emerge quite clearly.

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(8) Most observers who have attempted to make corrections of census figures tend to produce figures which show much greater stability in activity rates than does the census, cf. Long, *op. cit.*, and Bjerke's figures for the Danish labour force, "The National Product of Denmark 1870-1952", *Income and Wealth*, Series V, p. 151.

(9) Cf. Josrock's comments on the German census of 1882, which undercounted family workers, "The Long-Term Growth of National Income in Germany", *Income and Wealth*, Series V, p. 101.

The post-war period has been one of very high employment in the Netherlands, Norway, Sweden and the United Kingdom, with unemployment at about 1 to 2 per cent of the labour force, and there has been a steady move in the same direction in Germany. In Denmark, unemployment has hovered around 5 per cent of the labour force, and in Italy unemployment has varied around 9 per cent.

This makes, perhaps, the most striking contrast with the years from 1920 to 1938 when unemployment was allowed to reach levels which would now be unthinkable in many countries. Even in the 1920s unemployment was considerably above the pre-1913 average and in the 1930s the unemployment rate averaged about 10 per cent or more.

It is interesting to see that post-war experience is not really so different from that before 1913. In the case of the United Kingdom, the 1900-1913 unemployment average was 3.3 per cent of the labour force as compared with 1.5 per cent from 1950-57. One of the reasons why the post-war experience is usually considered unique is that it has generally been so much better than the famous 3 per cent put forward by Lord Beveridge as a goal of policy. Beveridge's target was not based on historical analogy, but in terms of historical experience it was not too ambitious.

(d) *Changes in Annual Working Time per Head.*

In the period since 1870, there have been such considerable changes in working hours that we felt it necessary to make some adjustment for this even though the data available are very inadequate. In general, working hours are recorded only for manufacturing industry, and we have taken these figures to indicate movements in working hours for the economy as a whole. This is probably a reasonable assumption over long periods, but working hours in manufacturing are more sensitive to changes in the conjuncture than are working hours generally, so that our figure for 1938 is probably rather too low, compared to our other benchmark years 1870, 1913, 1929 and 1957, in which the level of activity was higher.

From 1870 to 1913, working hours fell generally from about 66 hours a week to about 54 hours, and by 1929 the working week

had fallen to about 47 hours. There was some further fall in most cases between 1929 and 1938, with little net change since then. From 1913 onwards, there has also been a steady increase in the number of days taken for holidays and, since the war, increased leisure in the form of holidays has probably been more popular than shorter hours.

Total Labour Input

It is now possible to assess the movement in labour input in the different periods under review. In all countries, except Denmark, the pace of growth dropped sharply in the period 1913 to 1938, mainly because of increased unemployment, the fall in working hours and activity rates. In some countries there was even an absolute fall in labour input. From 1938 to 1957 the increase in labour input was very high compared with either the inter-war or pre-1913 period — thanks to decreased unemployment, the rise or stability of activity rates, and stable or rising working hours. In most countries the biggest increase in labour input took place from 1938 to 1951, but in Germany the biggest increase has taken place since then.

TABLE 5

THE ANNUAL RATE OF INCREASE IN TOTAL LABOUR INPUT (1)

	Denmark	Germany	Italy	Nether-lands	Norway	Sweden	United Kingdom
1870 - 1913	0.6	0.8 (2)	0.2	1.0 (3)	0.4 (3)	0.2	0.6
1913 - 1938	0.6	0.4	- 0.9	0.5	- 0.3	0.1	- 0.3
1938 - 1957	0.6	1.0	0.9	1.7	1.2	0.4	0.7
1938 - 1951	0.7	0.3	0.9	1.9	1.7	0.6	0.7
1951 - 1957	0.2	2.5	0.9	1.3	0.1	0.1	0.6

(1) *i.e.* labour force adjusted for unemployment and changes in annual working hours per head.

(2) 1871-1913.

(3) 1900-1913.

TABLE 6

RATES OF GROWTH OF GNP PER MAN HOUR (a)
(*Compound Rates*)

	Denmark	Germany	Italy (1)	Nether-lands	Norway	Sweden	United Kingdom
1870–1913	2.5	2.3 (2)	1.2	1.2 (3)	2.2 (3)	2.8	1.7
1913–1957	1.6	1.3	2.1	1.5	2.5	2.2	1.5
1913–1929	2.2	0.9	2.4	2.6	3.0	1.4	2.0
1929–1938	0.5	0.8	3.0	0.0	3.4	2.1	1.9
1913–1938	1.6	0.9	2.6	1.6	3.1	1.6	1.9
1938–1951	1.4	0.6	0.1	0.2	0.7	2.6	0.4
1951–1957	2.4	4.8	4.4	3.8	3.5	3.7	1.9
1938–1957	1.7	1.9	1.4	1.3	1.6	2.9	0.9

(a) *i.e.* GNP divided by labour force, adjusted for changes in unemployment and annual working time per head.

TABLE 7

ALTERNATE ESTIMATES OF RATES OF GROWTH OF GNP PER MAN HOUR (b)
(*Compound Rates*)

	Denmark	Germany	Italy (1)	Nether-lands	Norway	Sweden	United Kingdom
1870–1913	2.5	2.3 (2)	1.2	1.2 (3)	2.2 (3)	2.8	1.7
1913–1957	1.7	1.2	1.6	1.4	2.4	2.1	1.6
1913–1929	1.8	0.8	1.9	2.4	2.8	1.6	1.9
1929–1938	1.5	0.9	2.5	0.0	3.3	1.5	1.9
1913–1938	1.7	0.8	2.1	1.5	3.0	1.6	1.9
1938–1951	1.4	0.1	– 0.6	– 0.1	0.6	2.4	0.5
1951–1957	2.4	5.5	4.4	4.2	3.6	3.6	2.5
1938–1957	1.7	1.8	0.9	1.2	1.6	2.8	1.1

(b) *i.e.* GNP divided by population of working age, adjusted for changes in unemployment and annual working time per head.

(1) In the case of Italy, it is assumed that the rate of unemployment has been constant throughout.

(2) 1871-1913.

(3) 1900-1913.

Productivity

We have derived estimates of productivity by dividing our estimates of output by our figures for total labour input. It should be noted that our productivity figures in Table 6 will suffer from all the imperfections mentioned above, and we have, in fact, given an alternative set of figures in Table 7 which shows productivity growth on the assumption that the activity rate has been stable over time. Most of the following conclusions hold good in terms of both tables, although the argument is stated in terms of Table 6 which is generally preferable.

In the period 1870-1913, the average rate of productivity growth for our seven countries was 2 per cent per annum. Progress was well above average in Sweden and Denmark, and relatively slow in Italy, the Netherlands and the U.K.

In the period 1913-1929, the average growth of productivity in our seven countries was slightly higher at 2.1 per cent than before the first World War. This is a rather surprising result as this period includes four years of war. However, the rate of growth was considerably reduced in Germany and the two countries with the highest rates of growth in the period were the Netherlands and Norway which, as neutrals, had probably received more stimulus than damage from the war. On the other hand, the rate of growth was also higher in both Italy and the U.K.

In the 1930s the average rate of productivity growth for our seven countries was reduced to 1.7. The average is heavily affected by the absolute fall in productivity in the Netherlands. In the U.K. and Germany, the rate of progress was virtually unchanged from that in the 1913-38 period, and in Italy and Norway there was even an acceleration in the rate of growth.

Over the whole period 1913-1938, which included the World War and the Great Depression, productivity growth averaged 1.9 per cent per annum, *i.e.* it was not substantially different from the period 1870-1913. The biggest retardation was in Germany, and there was also slower growth in Denmark and Sweden, but in Italy, the Netherlands and Norway, growth was accelerated considerably, and there was also a slightly faster pace in the U.K. It is usually considered that this period was one of stagnation, but the

stagnation was expressed in unemployment, a slower growth of output and stagnating trade, and did not have nearly such a big effect on productivity. The level of investment in the 1920s and 1930s was higher than before 1913 in most cases (except Denmark where productivity grew slower), and not so much investment was needed for capital "widening" as it had been before 1913. It is also likely that the rapid reduction in working hours after the first world war reduced physical strain to an extent which was reflected in productivity. Between 1870 and 1913, working hours generally were reduced from 66 to about 54 per week, and by 1929 to about 47 per week, and it may even be that the latter reduction, plus the increase in holidays, made a bigger qualitative difference than the first.

In the period from 1938 to 1957, the rate of productivity growth for our seven countries averaged 1.7 per cent per annum. This is not a particularly impressive record. In no country is it significantly better than the pre-1913 experience, and in most cases it is less than was accomplished from 1913-1929 when there were similar problems of war and reconstruction. Only in Germany and Sweden was growth accelerated in the 1938-1957 period, but one might have expected this to happen in the Netherlands and also in Denmark, as some compensation for their slow rate of progress in the 1930s.

However, it is perhaps too much to expect that net growth of productivity from 1938-1957 should be higher than from 1913 to 1929. The second world war affected more of our countries than did the first, and the success in the employment field itself has limited the success in terms of productivity, as we shall explain below.

If we take the post-war period alone, we do, of course, get impressive rates of growth which average 3.5 per cent for our seven countries. However, it is not surprising to find high rates of growth in such a period. There is strong reason to suspect that there was still a substantial element of recovery in productivity growth after 1951, in view of the very slow growth from 1938 to 1951, and the retarded growth of productivity in the 1930s. This is particularly true of Germany, Italy and the Netherlands, and in two of the other countries — Denmark and the U.K. — the growth of productivity since 1951 has not, in any case, been particularly high by historical standards.

However, there are some reasons to believe that Europe may also be on a better long-term productivity trend than in the past, and it would be a mistake to reject this hypothesis simply on the grounds that net progress from 1938 to 1957 has been unimpressive, or that the gains since 1951 have contained special elements of recovery. It seems worthwhile, therefore, to analyse the factors affecting productivity growth in the past few years before arriving at any final judgment. We shall examine the following factors in turn:

(i) the nature of the recovery elements which have influenced economic development in the past few years to see if they have a once-for-all character;

(ii) the rate of investment;

(iii) the capital output ratio.

(i) *Recovery Elements.*

We have picked a period beginning in 1951 in order to exclude the immediate post-war elements of recovery (10). In the years just after the war, increases in inventories greatly stimulated the flow of production, and repairs to damaged plant and equipment had a large impact on effective capacity and labour productivity. The emergence from autarchy and bilateralism in trade had similar effects in removing bottlenecks, providing bigger markets and economies of scale. Productivity benefited from the adoption of technical advances which had been made in other countries during the war. Work became more efficient as people recovered from the distortions in economic attitudes and incentives induced by wartime experience of production for an occupying power, service in the army, or black marketing. These were the main factors influencing productivity in the period in which the pre-war levels were being regained and perhaps even for some time afterwards. They had probably exhausted most of their impact by 1948 in Denmark and Sweden, and probably in Norway and the United Kingdom as well. In Germany, Italy and the Netherlands, however, the period of recovery was preceded by a period of severe dislocation which,

(10) By 1951 all our countries had regained their pre-war productivity level in terms of Table 6, but this was not true of Italy or the Netherlands in terms of Table 7.

in Germany, was aggravated by the arbitrary division of the economy and the stagnation preceding the currency reform. So that for these three countries, this initial period was probably not over until 1950 or 1951, and even so these elements of recovery from the war probably persisted for a number of years in some branches of industry.

During the initial recovery period, the shortage of capital equipment was a factor which hindered the growth of labour productivity, particularly as all of our countries, except Germany, were making much fuller use of their labour supply than they had in pre-war years, so that the amount of capital per head was generally reduced, and the quality of the capital stock was lowered because so much replacement had been delayed (11). It therefore proved a much bigger problem to raise capital per head to pre-war levels, and to make good arrears of replacement after the second world war than after the first, because labour input was substantially increased instead of being substantially reduced. Since 1951 the quality of capital equipment has probably increased more rapidly than one would expect in future, because an abnormal backlog of old equipment has been scrapped.

A third type of recovery or backlog was due to the elimination of uneconomic habits acquired in the inter-war period as a result of prolonged unemployment. The high levels of demand and activity in the post-war period have not only had the measurable effects on working hours, unemployment and activity rates which we have noted above, but they have also had a salutary effect on productivity. They have tended to draw people from unremunerative but safe occupations as the prospect of unemployment receded. Full employment has made restrictive union practices less necessary, and producers have been less prone to make cartel and market-sharing arrangements. Producers have been able to plan ahead better and arrange production lines more economically. Although the net effect of full employment and high levels of activity has probably been positive, it obviously has not been entirely favourable to productivity growth. The reduction in the margin of unemploy-

(11) We are speaking here of the capital stock in the sense of the plant and equipment in physical use. If we think instead in terms of the accounting concept of a capital stock after allowance for depreciation, then we would not count the obsolete equipment at all, but simply say that capital per head had been further reduced.

ment has brought the least efficient members of the labour force into activity and has increased the recruitment difficulties of the most rapidly expanding firms.

It may be argued that the existence of a large productivity differential between Europe and the U.S. represents another element of backlog which has been exploited by Europe as a source of rapid productivity growth. This backlog has, of course, existed for several decades, so that it could hardly be considered to provide any special reason for a post-war rate of growth faster than that in the inter-war period, although there has been more awareness of it in the post-war period. There is no doubt about the fact that an inferior starting position can be exploited so as to speed the process of growth, particularly if such a position is due to ignorance of the best technical practices, poor management, a badly educated labour force, and badly organised and uncompetitive markets. However, only a small part of the difference between European and American productivity is due to such reasons. A major reason for higher American productivity is that the American capital stock is bigger, and the faster growth of American productivity in the past has been largely due to a higher rate of American investment, although growth was also aided to some extent by better natural resources. The best way to emulate American productivity is therefore to raise the rate of investment.

It seems clear then that there have been special elements of recovery in the past few years which one would expect to stimulate productivity growth. Some of these have had a once-for-all character which would lead us to expect the future growth to be smaller. However, some of the faster growth has been due to higher capital formation, and, to this extent, it is reasonable to suppose that the faster rates of productivity growth can be expected to continue. It is therefore worth looking in more detail at what has been happening to capital formation and to the capital output ratio.

(ii) *The Rate of Investment.*

From the evidence available, it is clear that most European countries have been investing more in the post-war period than has been the case in any recorded period of equal length. The post-war rate of investment has been particularly high in Germany, the Netherlands and Norway, but even in the United Kingdom, where

it has been low, the rate has also been higher than the long-term rate (12). Furthermore, the rate of investment has been higher in most European countries than in the United States, where the rate has, in fact, been below the long-term average (13).

RATES OF INVESTMENT — TABLE 8

	Denmark (1)	Germany	Italy	Netherlands	Norway	Sweden	United Kingdom (2)
1870–1913	13.6	—	11.2	—	12.7 (3)	8.1	9.2
1920–1929	10.6	—	16.7	—	14.7	11.7	—
1920–1938	12.0	13.6 (4)	16.3	—	15.1	13.3	10.2 (5)
1948–1957	17.1	23.4 (6)	201	23.8	29.7	20.2	14.6

(1) Excluding inventories.
(2) The figures for the U.K. would be 12.8, 10.5 and 15.3 if foreign investment were included.
(3) 1900-1913.
(4) 1925-34 and 1936.
(5) 1924-1938.
(6) 1950-1957.

The impact of investment on the growth of GNP will depend upon the purposes for which investment is used. Not all investment goes directly to productive purposes. A good deal of post-war investment has gone into housing, a smaller amount into public works, and a good deal of "productive" investment has been designed as much to improve amenities or working conditions as to raise capacity. In Europe as a whole, about a quarter of investment goes to manufacturing and about a quarter to housing with

(12) The accompanying table shows the proportion of GNP devoted to domestic gross investment including inventories. This proportion is given in terms of current prices. In most countries for which estimates are available in constant prices, it appears that the price of investment goods has risen more than GNP so that our ratios for earlier years would be higher if measured in terms of present day prices. However, this would not change our general conclusions.

(13) The post-war U.S. rate from 1948-57 has been 17.8 per cent in terms comparable with our table. This is lower than the long-term average for the U.S. given by KUZNETS, *Capital Formation and Economic Growth*, N.B.E.R. 1955, p. 62, *i.e.* 21.8 per cent for 1869-1908, and 20.8 per cent for 1909-1948. Kuznets' concept of capital formation is slightly different from that of the OEEC, which we have used, but the difference is not such as to make our conclusion invalid.

a slightly higher proportion going to manufacturing in the U.K. and Germany (14). Unfortunately, there are very few historical data on the proportionate distribution of investment with which to compare the present distribution. It seems that a smaller proportion of post-war British investment has gone to housing than was the case historically (15), but there is no evidence that post-war investment in Europe has been strongly biased in a "productive" direction as it has been for instance in the USSR.

The impact of investment on productivity will depend upon whether it is destined to replace existing capital, to increase capital per head, or to provide capital for additional workers. The impact of replacement investment on capacity and productivity will be smaller than that of net additions to the capital stock. However, the impact of replacement investment will always be positive, for new equipment is always more efficient than that which is replaced and usually incorporates new technique as well. The older the equipment which is replaced, the bigger will be the contribution to capacity and productivity of the new investment. During the war and in the early post-war years, the normal life of capital was prolonged, so that there was a backlog of abnormally obsolete capital to be replaced in the late 1950s, and hence replacement investment brought bigger productivity gains than one would normally expect.

It is not possible to estimate what proportion of capital formation has been destined for replacement in the post-war period, but for the period 1948-1957 as a whole it has probably been no higher

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(14) PROPORTIONATE DISTRIBUTION OF GROSS FIXED INVESTMENT

	Germany	United Kingdom	OEEC Countries	U.S.	USSR
Manufacturing	28	26	23	25	40
Housing	22	21	24	25	10–15
Other	50	53	53	50	45–50

U.K. figures from U.K. National Income bluebook refer to 1948-57, German figures from *Vierteljahrshefte zur Wirtschaftsforschung*, Berlin, refer to 1956-57; for OEEC countries from OEEC 8th Annual Report, Vol. II, *Europe in 1960*, p. 61, and refer to 1955. For the U.S. and Russia, the figures are historical averages quoted by NORMAN M. KAPLAN, "Capital Formation & Allocation", in *Soviet Economic Growth*, edited by A. Bergson.

(15) Cf. E. H. PHELPS BROWN and S. J. HANDFIELD JONES, "The Climacteric of the 1890s", in *Oxford Economic Papers*, October 1952, who show a gross investment in housing of £1,941 million from 1871-1912 total capital formation including inventories of £6,275 million in constant prices.

than it was in the long run for pre-war years. The amount of investment needed for replacement backlogs was, of course, higher than the long-run norm, but the rate of investment was raised so that there was a compensating tendency for the share of replacement to fall. One would certainly expect that, in future, replacement will be a smaller part of total investment than it was in pre-war years, if the higher rate of investment continues. The additions to the capital stock each year will be bigger relative to the amount of old capital which is scrapped, unless there is a considerable reduction in the life of capital assets (16).

It is impossible to distinguish quantitatively between increases in the capital stock which are designed to provide for the increase in the labour supply, and those destined to increase capital per head, and there is no reason to expect that the distinction will be clear in practice. In cases where the increase in labour supply takes the form of increased working hours, the existing capital stock should be quite adequate, and can simply be used more hours per day. Where the increase in labour supply is due to an increase in employment, it is always possible to put more people into a factory or office, even if the new people do need extra lathes or typewriters. This is undoubtedly what happened during the war and early post-war years, and it did have adverse effects on productivity in many cases. In the later post-war period extra factory and office space has been built for these additional workers. This addition to the capital stock has been a "widening" of capital in the sense of providing for extra workers, but as they were hired before the "widening" took place, the investment also "deepened" the capital stock by restoring previous levels of capital per head. This investment has therefore contributed to productivity growth during the past few years. In future, a smaller proportion of investment will be needed for "widening" of capital as the rate of growth of labour input will be considerably below the 1938-57 rates in most countries.

In spite of the backlog of replacement and the need to "widen" the capital stock, there seems little doubt that the increase in the

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(16) Professor Domar gives a detailed explanation of the relation of replacement requirements to total capital formation for different rates of growth of capital and different lengths of life of assets; cf. *Essays in the Theory of Economic Growth*, O.U.P., 1957.

rate of capital formation in most countries has been high enough to raise capital per worker well above pre-war levels, and in certain countries, such as Germany, Norway and Sweden, the rate of increase of capital per worker in recent years has probably been quicker than ever before. In future, the proportion of new investment required for replacement and for "widening" of capital will be smaller than in recent years, so that we might expect the rate of productivity growth to be even higher in future than it has been since 1951 — if similarly high rates of investment are maintained (17). The advantages of these higher rates of investment may, however, be diminished if the capital output ratio rises. It is necessary, therefore, to see whether this is likely before we can conclude that Europe has entered on a new productivity trend. It is also helpful to restate some of the previous argument in terms of the post-war development of the capital output ratio.

(iii) *Capital Output Ratio.*

We may first ask how we would expect the capital output ratio to have behaved in the post-war period in the absence of any changes in the rate of innovation. We would expect that capital equipment would be used intensively in wartime and in the early post-war years when demand was very high, resources available for new investment were low and more labour was employed. In such a situation, the productivity of capital would be increased at the expense of the productivity of labour. However, we would expect that as conditions became more normal and labour input grew more slowly, the use of capacity would become less intense and that there would be a return to higher average capital output ratios.

In Germany, one might have expected a somewhat different situation. Activity remained at low levels in the early post-war years, in 1950 labour input was about the same as in 1938, and effective capacity was much greater, in spite of war damage. One

(17) The disappearance of some of the recovery elements mentioned above which were not connected with new capital formation will, of course, be an offsetting factor, and the replacement and widening investment will also have less of an impact on productivity than in the past few years.

might have expected the German capital stock to be partly idle and the capital output ratio to be above pre-war. The big increase in German labour input occurred after 1950 when it increased by a fifth (whereas the big increase had happened earlier in other countries) so that one would expect German capital equipment to have become more intensively used rather than less intensively.

Unfortunately, the evidence available on the average capital output ratio is rather limited. Estimates of the capital output ratio for post-war years are available for only three European countries, Germany (18), Norway (19), and the United Kingdom (20). For Norway, the evidence is somewhat similar to what we expected, with the capital output ratio (total fixed real capital divided by net real domestic product) falling in the early post-war years and rising steadily from 1950 onwards, although it was still less than the pre-war average in 1955.

For the United Kingdom, Redfern's figures for the total fixed capital stock show some fall (21) in the capital output ratio from 1938 to 1947, with little change up to 1953. There has probably been an increase since then as the incremental capital output ratio has been large in recent years. For manufacturing alone the evidence is that the 1948 British capital output ratio was already at the 1937-38 level, but that it rose thereafter until by 1956 it was at the higher 1929 level. However, the capital output ratio for the economy as a whole may have increased less than in manufacturing because of government restrictions on non-industrial investment.

For German manufacturing, Krengel's figures show that the average capital output ratio was very high in the early post-war

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(18) R. Krengel, *Anlagevermögen, Produktion und Beschäftigung der Industrie im Gebiet der Bundesrepublik von 1924 bis 1956*, Deutsches Institut für Wirtschaftsforschung 1958.

(19) *Real Capital in Norway, 1900-1956*, O. Aukrust and J. Bjerke, paper given at the Pietersberg Conference of the International Association for Research in Income and Wealth, August 1957.

(20) P. Redfern, "Net Investment in Fixed Assets in the United Kingdom 1938-1953", *Journal of the Royal Statistical Society*, 1955, and Tibor Barna, "Investment in Industry - Has Britain Lagged?", *The Banker*, April 1957. Barna has carried Redfern's estimates farther for manufacturing and has adjusted them to include wartime government capital formation at its full value which Redfern does not include at all.

(21) The fall in the U.K. was about 10 per cent from 1938 to 1947. In Norway the fall was about twice as large.

years, and was steadily reduced until about 1953 when it reached something like the pre-war norm. It has since levelled out.

Thus, the evidence, though rather scanty, seems to bear out our general hypothesis (22). It is worth noting that several studies have also shown a decline in the ratio of capital to output in the post-war period in the United States. This is true for the estimates of the capital output ratio for the economy as a whole as measured by Goldsmith (23) and Fellner (24), for the private sector of the economy as measured by Terborgh (25), and for manufacturing as measured by Wooden and Wasson (26). All these studies show that the United States capital output ratio had been substantially reduced during the war and that it has remained below the pre-war level even though it has been increasing steadily since 1945. These studies show that the reduction in the ratio is due to the fall in the ratio of structures to output, the ratio of equipment to output being about the same as pre-war (27).

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(22) The estimates cited are based on the perpetual inventory method of calculating the capital stock after allowing for depreciation. For our purpose, it would be better to measure the capital stock gross of depreciation and net only of actual replacement. This would, however, be impossible to measure. Both Krengel and Redfern do, however, give alternative figures showing the capital stock net of calculated replacement — and these figures also bear out our argument. Krengel does make some attempt to take account of variations in the rate of replacement, by assuming that the life of equipment assets has steadily shortened in the period he covers.

(23) Raymond W. Goldsmith, " The Growth of Reproducible Wealth of the USA from 1805 to 1950 ", *Income & Wealth*, Series II, International Association for Research in Income and Wealth, 1952, pp. 299-300, and *A Study of Savings in the United States*, Princeton, 1956.

(24) William Fellner, " Long-Term Tendencies in Private Capital Formation ", *Long-Range Economic Projection*, Conference on Research in Income and Wealth, N.B.E.R., 1954.

(25) George Terborgh, various numbers of the *Capital Goods Review*, Machinery and Allied Products Institute, Washington, particularly No. 22, which shows the capital output ratio in 1955 to be about three-quarters of that in 1929.

(26) D. G. Wooden and R. C. Wasson, " Manufacturing Investment since 1929 ", *Survey of Current Business*, November 1956. This article shows a similar change in the capital output ratio from 1929 to 1955 as the source in the footnote above.

(27) There has been a much greater increase in labour input in the U.S. than in Europe since pre-war, and perhaps a bigger increase in the cost of factory construction relative to the cost of machinery. There has probably been an even greater incentive to economise on capital in buildings than in Europe, and greater possibilities of doing so because the United States normal pre-war range of spare capacity was probably greater than in Europe and the average age of capital lower. The average age of American capital is certainly lower in the statistical estimates of Wooden and Wasson and Terborgh, who use the average lives of the Bureau of Internal Revenue, *Bulletin F*, which are shorter than those used for the U.K. and Norway (but not shorter than those for recent years used by Krengel for Germany). Some American writers have attributed the reduction in the construc-

It is likely that the experience of most European countries has been somewhat similar to that of Norway and the U.K., *i.e.* with some lowering of the capital output ratio in the early post-war years, and a subsequent rise in the ratio.

In a period in which the average capital output ratio is below the long run trend, it does not follow that the incremental capital output ratio will also be below its long-run trend. The relation between the average and incremental ratio will depend on the direction in which the average ratio is moving. When the average ratio is falling, as it has been in Germany, then the incremental ratio will be lower than the average. When the average ratio is rising, the incremental ratio will, of course, be higher than the average. Thus, even though the average ratio may be below its long-run norm, the incremental ratio may well be above its long-run norm, if the average ratio is rising rapidly. In such circumstances, growth will be fairly expensive in terms of capital formation.

In Table 9 we show the gross incremental capital output ratios (28) for the period 1949-1957, broken down by non-residential

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tion output ratio to changes in the structure of industry — *e.g.* chemical plants which require no buildings, or to geographical shifts of industry to California and the South where structures are less necessary for weather protection.

(28) We have estimated the incremental capital output ratio by cumulating gross capital formation (including inventories) in constant prices for the eight years 1949-56 inclusive, and we divided this by the increment in GNP in constant prices in the eight years between 1949 and 1957, thus allowing a lag of one year for the investment to take effect. These incremental ratios have certain disadvantages, but they are at least something which we can measure for all our countries. Our estimates exaggerate the ratio of capital to output because they make no allowance for replacement or depreciation. However, we do, at least, include depreciation in our denominator — GNP — as well as in our numerator, and we could not make estimates of net capital formation without information on the initial size of the capital stock or its age structure. Comparison of our results between countries and over time is affected by the fact that the share of replacement in total investment will vary. When the share of replacement is high, this will raise the gross capital output ratio. However, capital stock estimates which allow for replacement do so on the basis of hypothetical rather than actual replacement so that they are equally defective as measures of change in the physical stock of equipment in use. The same is true of estimates of the capital stock after allowing for depreciation. Normally, when the rate of investment rises considerably, as it has in the post-war period, one would expect depreciation or replacement to decline as a share of the total gross investment, and the increase in gross capital formation in such a period would understate the increase in the capital stock compared with the increase that would be shown by estimates net of depreciation or replacement. However, we assume that the normal tendency for the share of replacement to fall as the rate of investment increases has been offset in the past few years by a backlog of replacement requirements.

GROSS INCREMENTAL CAPITAL OUTPUT RATIOS TABLE 9

	1 Increase in G.N.P. 1949-57	2 Cumulative Gross Capital Formation 1949-56	3 Cumulative Gross Non-Residential Construction 1949-56	4 Cumulative Gross Machinery and Equipment Investment 1949-56	5 Cumulative Stock Formation 1949-56	Capital Output Ratios			
						2/1	3/1	4/1	5/1
Denmark . .	6,070	39,930	9,455	21,530	3,020	6.6	1.6	3.6	0.5
Germany (1) .	80,450	235,359	49,200	111,375	25,584	2.9	0.6	1.4	0.3
Italy	5,383	18,383	2,332	11,535	763	3.4	0.4	2.1	0.1
Netherlands .	9,300	46,270	13,330	20,770	4,000	5.0	1.4	2.2	0.4
Norway . . .	6,282	50,664	12,947	26,145	3,040	8.1	2.0	4.2	0.5
Sweden . . .	11,138	63,403	22,960	22,120	3,060	5.7	2.1	2.0	0.3
United Kingdom	3,670	19,809	4,969	9,625	1,105	5.4	1.4	2.6	0.3

Source: OEEC: *General Bulletin of Statistics*, January, 1959. Absolute figures in million units of national currency in 1954 prices (for Italy: billion units).

(1) Column 1 refers to 1950-57, columns 2, 3, 4 and 5 to 1950-56. Figure for column 3 is my estimate.

construction, machinery and equipment, and inventories. It can be seen that there is considerable variation in the ratios. The overall ratios are reasonably similar in the United Kingdom, the Netherlands and Sweden, rather higher in Denmark, very high in Norway, and particularly low in Germany and Italy. In the case of Italy the ratio for machinery and equipment is not particularly low, but the overall ratio is brought down by the low figure for construction.

For a few countries we can compare the post-war ratio with the long-term experience. We can do this for Denmark, Italy, Norway and the United Kingdom. It can be seen that the incremental capital output ratio has been higher in the post-war period

in Norway, Denmark and the United Kingdom than it has been historically, and that it has been much lower in Italy.

TABLE 10

INCREMENTAL GROSS CAPITAL OUTPUT RATIOS

	Denmark (1)	Italy	Norway	United Kingdom
1870–1913	5.2	6.9	5.2 (2)	4.3 (3)
1920–1938	6.0	7.3	5.2	3.8 (4)
1949–1957	6.1	3.4	8.1	5.4

(1) Figures exclude inventories.

(2) 1900-1913.

(3) Domestic capital formation, the ratio would be 6 if foreign investment were included. In the other periods net foreign investment was negligible.

(4) 1924-1938.

The above evidence on incremental capital output ratios seems consistent with our hypothesis that the average capital output ratio has been rising in most countries, except Germany where it has been falling. It also seems that it has been falling in Italy, probably for rather different reasons from those operating in Germany. In Italy the incremental capital output ratio was extremely high from 1870 to 1938, probably because of large expenditures on public buildings. In the post-war period the Italian capital output ratio has been low, largely because of the small amount of resources devoted to construction, so that earlier over-investment has made recent growth cheaper. The low stock output ratio for Italy may be due to the declining relative importance of agriculture in the economy, for the average stock output ratio is usually much higher in the agricultural than in the non-agricultural sector.

In the case of Norway the incremental capital output ratio has been so large that it might be taken as evidence of a move towards a much higher average capital output ratio than pre-war rather than as simply a return to a previous level. It might well be considered that the rise in the Norwegian capital output ratio has occurred because the investment rate of about 30 per cent is high enough to cause diminishing returns. However, Norwegian post-

war investment in long-lived assets, such as hydro-electric stations and shipping has been substantial, and in future there will probably be less need for investment in these capital-intensive sectors.

Thus, there is no reason to think that the behaviour of the capital output ratio in the past few years has been particularly favourable to economic growth, except in Germany and Italy. One can expect the average capital output ratio to return to a more stable level in future so that the capital costs of economic growth will be generally somewhat lower than in the past few years, but higher in Germany, and in the longer run in Italy as well.

Conclusions

Our conclusions therefore are as follows:

(i) European countries increased labour input faster than ever before from 1938 to 1957 by eliminating unemployment and by checking and, in some cases, reversing the long-term trend towards lower activity rates and shorter working hours. These gains are largely of a once-for-all character, and in most countries, except Italy, there will be a reversion to slower growth rates.

(ii) This increase in labour input had some temporary adverse effects on productivity in the early post-war years.

(iii) Productivity growth in the past few years has been faster than the long-run trend, partly because of some once-for-all elements of recovery, but also because of higher investment.

(iv) The rate of investment in the past few years has been much higher than the long-run average in all European countries, but the full impact of higher investment on productivity has not been felt because of backlogs of replacement and capital " widening ".

(v) The average capital output ratio has been low in the post-war period in most countries, but as it has been rising, the incremental ratio has been as high or higher than the long-run average. In Germany and Italy, where special conditions have prevailed, the incremental ratio has been much lower than the long-run trend.

(vi) For the future, the rate of growth of European output will be faster than the long-run trend before 1913 if present levels of

investment continue. In quantitative terms, the norm will probably be an economy with an investment rate of about 20 per cent, and output growing at 3.5-4.0 per cent a year, to which productivity will contribute about 3 per cent. Some countries may be able to do better than this by higher investment rates or efficient exploitation of backlogs. If countries do worse than this, there will probably be reason to suspect them of bad economic policies.

Paris ANGUS MADDISON

STATISTICAL ANNEX

GROSS NATIONAL PRODUCT (1913=100)

TABLE I

	Denmark	Germany (F.R.)	Italy	Netherlands	Norway	Sweden	United Kingdom
1870	26.7	27.4(1)	54.8			27.3	37.4
1880	33.3	44.6(2)	60.2			35.8	44.9
1890	44.1	67.1(3)	62.6			43.2	68.0
1900	63.5	77.7	70.4	75.0	71.6	62.7	83.3
1901	67.0	79.5	76.8	73.4	73.5		83.2
1902	65.7	81.3	73.6	78.1	74.5		84.4
1903	67.7	83.0	80.0	79.7	74.1		82.5
1904	70.4	84.5	79.1	79.7	73.8		83.0
1905	71.0	86.3	83.3	81.3	74.6		86.4
1906	76.0	88.0	83.5	84.4	76.7		90.3
1907	81.0	89.9	88.6	85.9	79.6		92.0
1908	79.1	91.6	89.7	85.9	82.0		89.3
1909	82.0	93.4	92.3	89.1	83.9		90.6
1910	83.6	95.1	87.5	89.1	88.5	88.9	93.4
1911	88.0	96.6	96.7	92.2	90.3		95.4
1912	96.6	98.4	96.2	98.4	94.4		97.9
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1920	123.9		106.6	117.2	123.2		
1921	109.3		108.9	123.4	110.5		
1922	115.0		113.4	128.1	123.2		
1923	121.0		116.6	132.8	126.8	100.7	
1924	122.8		117.2	137.5	126.2	104.4	106.6
1925	122.2	94.0	122.1	143.8	131.7	104.6	108.5
1926	126.3	97.0	122.9	151.6	133.1	112.8	109.5
1927	132.2	105.0	122.1	156.3	138.6	117.7	118.8
1928	135.4	109.0	130.4	164.1	135.8	119.2	120.8
1929	140.0	108.0	132.9	168.8	155.1	128.7	122.8
1930	154.6	104.0	125.7	168.8	166.9	131.1	122.2
1931	159.1	92.0	127.4	157.8	153.5	123.0	122.5
1932	149.6	82.0	132.7	153.1	162.9	112.7	123.4
1933	152.8	86.0	132.0	150.0	166.9	116.0	130.8
1934	159.7	95.0	131.0	148.4	171.3	128.4	135.4
1935	158.8	102.6	144.1	151.6	180.5	132.6	140.7
1936	168.6	112.5	145.3	159.4	190.6	140.0	146.0
1937	170.8	122.4	154.2	171.9	197.8	154.0	146.5
1938	170.0	135.2	153.8	170.3	202.7	154.5	149.5
1948	197.0		143.3	195.3	248.1	205.7	158.6
1949	204.7		151.2	210.6	252.4	218.5	164.1
1950	220.9	136.2	162.1	217.9	265.7	232.3	170.2
1951	222.5	152.2	174.6	223.1	276.5	229.4	174.4
1952	223.8	162.6	179.5	227.8	292.1	235.1	172.8
1953	237.5	175.2	193.3	247.5	298.2	243.4	180.4
1954	243.5	187.5	203.0	267.3	312.8	258.5	189.0
1955	242.3	209.6	216.7	283.4	318.8	268.0	195.2
1956	247.1	223.0	225.8	295.1	332.0	276.6	199.2
1957	260.6	234.2	238.9	302.1	341.5	286.7	202.6

(1) 1871. (2) 1882. (3) 1891.

TABLE II

POPULATION (1913=100)

	Denmark	Germany (F.R.)	Italy	Netherlands	Norway	Sweden	United Kingdom
1870	63.3	61.2 (1)	74.2			74.1	68.5
1880	69.8	68.3 (2)	79.2			81.3	75.9
1890	76.9	74.3 (3)	84.6			85.1	82.0
1900	85.8	83.7	90.3	83.4	91.1	91.0	90.2
1901	86.9	85.0	90.9	84.7	92.2	91.7	91.0
1902	87.9	86.3	91.5	86.1	93.0	92.3	91.8
1903	88.9	87.5	92.1	87.4	93.5	92.7	92.6
1904	89.9	88,8	92.8	88.8	93.9	93.2	93.5
1905	90.9	90.0	93.5	90.1	94.4	93.9	94.3
1906	91.9	91.4	94.1	91.4	94.8	94.6	95.1
1907	93.0	92.6	94.9	92.6	95.2	95.3	96.0
1908	94.2	93.9	95.9	93.9	95.9	96.1	96.8
1909	95.4	95.1	96.9	94.8	96.7	97.0	97.6
1910	96.6	96.4	98.0	95.7	97.2	97.8	98.5
1911	97.8	97.6	99.0	97.1	98.1	98.6	99.3
1912	98.9	98.7	99.5	98.4	99.0	99.3	99.7
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1920	108.1	100.9	100.9	111.0	107.7	104.5	
1921	109.5	102.0	101.4	112.6	109.0	105.5	
1922	107.4	102.6	102.1	114.5	110.1	106.2	
1923	111.9	103.2	103.1	116.4	110.9	106.7	
1924	113.0	103.9	104.0	118.2	111.5	107.1	105.2
1925	114.2	104.7	105.1	119.9	112.2	107.5	105.4
1926	115.1	105.4	106.2	121.6	112.9	107.9	105.9
1927	115.8	106.1	107.0	123.3	113.4	108.2	106.2
1928	116.6	106.7	107.9	125,0	113.8	108.5	106.7
1929	117.3	107.3	108.6	126.6	114.2	108.7	106.9
1930	118.1	107.8	109.5	128.3	114.7	109.1	107.3
1931	119.0	108.4	110.3	130.2	115.4	109.4	107.8
1932	120.1	108.9	111.0	132.2	116.1	109.9	108.4
1933	121.1	109.4	111.7	134.1	116.8	110.3	108.9
1934	122.2	110.0	112.4	135.8	117.4	110.7	109.2
1935	123.2	110.8	113.2	137.3	118.1	111.0	109.7
1936	124.1	111.6	113.9	138.6	118.6	111.4	110.2
1937	125.0	112.4	114.7	139.9	119.3	111.7	110.7
1938	125.9	113.4	115.6	141.3	120.0	112.0	111.2
1948	139.6	132.0	124.3	159.4	130.8	122.4	116.7
1949	141.0	134.5	125.4	161.9	132.1	123.8	117.3
1950	142.4	136.6	126,4	164.6	134.0	124.8	117.8
1951	143.5	138.1	127.3	167.0	134.8	125.8	118.4
1952	144.5	139.0	128.2	168.9	136.0	126.7	118.8
1953	145.7	140.4	129.2	170.7	137.3	127.6	119.1
1954	146.8	142.0	130.3	172.7	138.6	128.4	119.5
1955	147.9	143.3	131.5	174.8	140.0	129.1	119.9
1956	148.9	145.0	132.5	177.2	141.5	130.1	120.4
1957	150.0	147.1	133.2	179.3	142.9	131.0	120.9

(1) 1871. (2) 1882. (3) 1891.

TABLE III

POPULATION OF WORKING AGE (1913=100)

	Denmark	Germany (F.R.)	Italy	Netherlands	Norway	Sweden	United Kingdom
1870	63.9	59.4 (1)	76.0			74.0	62.6
1880	69.7	64.8 (2)	82.0			82.6	69.3
1890	74.4	70.4 (3)	86.1			82.9	76.4
1900	84.5	80.0	89.7	82.0	89.0	88.9	87.5
1901	85.8	81.4	90.0	83.3	90.2	89.7	88.8
1902	86.8	82.7	90.6	84.7	90.9	90.4	89.7
1903	87.9	83.9	91.2	86.0	91.5	90.9	90.6
1904	88.9	85.3	91.8	87.4	92.0	91.5	91.7
1905	89.9	86.5	92.5	88.7	92.5	92.3	92.6
1906	91.0	87.9	93.1	90.0	93.0	93.0	93.7
1907	92.1	89.1	93.8	91.3	93.4	93.8	94.6
1908	93.3	90.5	94.8	92.6	94.1	94.7	95.5
1909	94.6	91.7	95.7	93.5	95.0	95.7	96.5
1910	95.8	93.1	96.8	94.7	95.5	96.6	97.5
1911	97.1	95.4	97.8	96.4	97.0	97.8	98.5
1912	98.5	97.6	98.9	98.1	98.4	98.9	99.3
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1920	110.9	105.7	103.5	113.7	112.1	107.5	
1921	112.8	107.5	104.4	115.7	114.0	109.1	
1922	111.2	108.8	105.1	118.0	115.7	110.5	
1923	116.6	110.2	106.1	120.2	117.1	111.7	
1924	118.4	111.6	107.0	122.4	118.3	112.7	109.7
1925	120.4	113.2	108.1	124.5	119.7	113.8	110.3
1926	122.0	114.1	109.2	126.6	121.0	114.9	111.1
1927	123.4	115.1	110.0	128.7	122.1	115.9	111.8
1928	125.0	115.9	111.0	130.8	123.1	116.8	112.6
1929	126.4	116.8	111.7	132.8	124.2	117.7	113.2
1930	128.0	117.5	112.6	135.0	125.3	118.8	114.0
1931	129.7	118.3	113.4	137.4	126.4	119.9	114.8
1932	131.6	119.1	114.1	139.9	127.4	121.2	115.7
1933	133.5	119.8	114.8	142.4	128.5	122.4	116.5
1934	135.4	120.1	115.5	144.7	129.4	123.6	117.1
1935	137.3	120,6	116.3	146.7	130.4	124.7	117.9
1936	138.3	121.2	117.0	148.5	131.3	126.0	118.7
1937	139.3	121.7	118.4	150.4	132.3	127.1	119.5
1938	140.2	122.4	119.8	152.4	133.4	128.2	120.3
1948	148.3	139.7	134.5	168.3	148.5	135.5	122.5
1949	148.7	142.7	136.3	170.4	150.3	136.3	122.7
1950	149.1	145.3	137.5	172.7	152.8	136.6	122.7
1951	149.7	147.3	138.4	174.5	153.1	137.0	122.9
1952	150.3	148.7	139.7	175.5	153.6	137.6	123.0
1953	150.9	150.8	141.1	176.6	154.1	137.9	123.0
1954	151.8	153.2	142.5	178.1	154.7	138.4	123.0
1955	152.5	155.9	143.8	179.9	155.6	139.1	123.2
1956	153.0	158.7	146.3	181.7	155.6	139.8	123.2
1957	153.9	161.0	147.3	183.6	155.8	140.7	123.4

(1) 1871. (2) 1882. (3) 1891.

TABLE IV

LABOUR FORCE (1) (1913=100)

	Denmark	Germany (F.R.)	Italy	Netherlands	Norway	Sweden	United Kingdom
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1920	103.0	106.1	102.4	113.0	110.8	116.1	104.8
1921	103.6	108.0	103.1	114.8	112.5	117.3	105.5
1922	102.4	109.4	103.0	116.9	113.9	118.4	106.1
1923	107.6	110.8	103.1	118.9	115.0	119.2	106.8
1924	109.5	112.3	103.2	120.8	115.9	119.7	107.5
1925	111.6	114.0	103.4	122.7	117.0	120.4	108.1
1926	113.3	114.2	103.6	124.6	118.0	121.1	108.9
1927	114.8	114.5	103.5	126.4	118.8	121.6	109.6
1928	116.6	114.6	103.6	128.3	119.5	122.1	110.4
1929	118.1	114.8	103.4	130.0	120.3	122.5	111.0
1930	119.9	114.8	103.4	132.0	121.0	123.1	111.8
1931	122.8	114.9	103.2	134.3	122.0	123.5	112.6
1932	126.0	114.9	103.5	136.7	122.8	124.1	113.6
1933	129.3	114.9	103.8	139.1	123.8	124.6	114.4
1934	132.5	116.0	104.2	141.3	124.5	125.0	115.1
1935	135.8	117.4	104.6	143.3	125.4	125.3	115.9
1936	138.3	118.8	104.9	145.0	126.1	125.9	116.8
1937	140.8	120.2	105.4	146.8	127.0	126.2	117.7
1938	143.1	121.8	105.9	148.7	127.9	126.5	118.5
1948	151.6	130.9	110.7	162.1	141.1	131.1	
1949	151.6	132.7	111.4	162.4	142.7	131.7	119.6
1950	151.7	134.1	111.5	162.9	144.9	132.3	120.6
1951	152.3	136.9	111.4	165.0	146.1	132.7	122.0
1952	152.9	138.8	111.7	167.0	145.3	133.1	122.3
1953	153.4	141.6	112.0	169.3	145.6	133.5	122.7
1954	154.0	145.8	112.3	170.9	146.2	133.9	124.2
1955	154.6	148.9	116.0	172.8	147.4	134.3	125.6
1956	155.1	153.1	116.7	175.0	148.4	135.0	126,5
1957	156.0	156.2	119.1	177.1	149.2	135.9	126.9

(1) For the years before 1913 labour force is assumed to move in the same way as population of working age.

TABLE V

UNEMPLOYMENT AS A PERCENTAGE OF THE LABOUR FORCE

	Denmark	Germany (F.R.)	Netherlands	Norway	Sweden	United Kingdom
1900						1.9
1901						2.4
1902						3.0
1903	6.6	2.3				3.5
1904	6.1	1.8		2.0		4.4
1905	6.6	1.5		2.2		3.7
1906	3.1	1.3		1.6		2.7
1907	3.6	1.4		1.3		2.7
1908	5.6	2.2		1.9		5.8
1909	6.6	2.1		2.5		5.7
1910	5.5	1.7		1.5		3.5
1911	4.9	1.5	1.4	1.0	2.7	2.2
1912	3.9	1.6	2.2	0.7	2.6	2.4
1913	3.8	2.1	2.8	0.9	2.2	1.6
1920	3.1	1.9	3.2	1.2	2.6	2.4
1921	10.1	1.4	5.0	8.9	13.0	12.6
1922	9.9	0.7	6.1	8.6	11.2	10.6
1923	6.5	5.0	6.2	5.4	6.1	8.7
1924	5.5	6.4	4.9	4.3	4.9	7.6
1925	7.5	3.3	4.5	6.7	5.4	8.4
1926	10.6	8.8	4.0	12.2	6.0	9.3
1927	11.5	4.6	4.1	12.8	5.9	7.2
1928	9.5	4.6	3.1	9.7	5.2	8.0
1929	7.9	6.5	3.3	7.8	5.0	7.7
1930	7.0	10.7	4.3	8.4	5.8	11.9
1931	9.1	16.3	8.2	11.2	8.2	15.8
1932	16.2	21.1	14.0	15.5	11.0	16.4
1933	14.7	18.4	14.9	16.8	11.4	14.7
1934	11.3	10.4	15.6	15.5	8.8	12.4
1935	10.1	8.1	17.5	12.8	7.4	11.5
1936	9.9	5.8	18.1	9.5	6.2	9.7
1937	11.2	3.2	14.9	10.1	5.3	8.0
1938	11.0	1.5	13.8	11.1	5.3	9.5
1950	4.4	7.6	1.6	0.6	1.1	1.5
1951	5.0	6.7	1.8	0.8	0.9	1.2
1952	6.4	6.3	2.8	0.9	1.1	2.0
1953	4.7	5.6	2.1	1.1	1.4	1.7
1954	4.1	5.2	1.5	0.9	1.3	1.4
1955	5.0	3.8	1.0	0.9	1.2	1.1
1956	5.7	3.0	0.7	1.0	1.1	1.2
1957	5.2	2.5	1.0	1.0	1.3	1.5

TABLE VI

ANNUAL HOURS WORKED PER HEAD (1913 = 100)

	Denmark	Germany (F.R.)	Italy	Netherlands	Norway	Sweden	United Kingdom
1870	122.7	122.7	122.7			122.7	122.7
1900				106.8	106.8		
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1929	87.5	85.2	87.9	86.9	86.5	87.0	86.5
1938	86.6	89.2	76.0	86.1	81.4	84.1	85.2
1950	83.7	88.0	80.3	88.2	80.0	81.9	83.5
1951	83.5	86.8	81.3	87.5	79.7	81.6	83.4
1952	83.5	86.9	81.2	87.7	79.1	81.3	83.5
1953	83.3	87.5	81.5	88.0	80.4	81.8	83.8
1954	83.2	88.8	81.6	88.0	78.9	81.1	84.6
1955	83.0	89.1	81.5	88.3	79.2	81.1	84.6
1956	82.9	87.5	80.4	88.1	79.0	80.8	83.9
1957	82.8	84.7	80.5	87.4	78.4	80.5	83.4

TABLE VII

G.N.P. PER MAN HOUR (1913 = 100)

	Denmark	Germany (F.R.)	Italy	Netherlands	Norway	Sweden	United Kingdom
1870	34.1	37.6	58.7			30.1	48.7
1900				85.6	75.3		
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1929	141.4	115.6	146.2	150.2	160.2	124.3	137.1
1938	148.2	123.7	191.1	149.9	217.0	150.0	161.8
1950	175.0	122.3	181.1	149.9	228.7	212.1	169.7
1951	177.1	134.3	192.7	152.9	237.3	208.9	171.5
1952	180.2	140.9	197.9	155.5	254.2	214.9	170.8
1953	187.6	146.7	211.7	165.0	255.3	221.1	176.5
1954	190.7	149.5	221.6	175.4	271.1	235.9	180.5
1955	191.2	160.7	229.3	182.4	273.2	243.4	183.6
1956	196.1	168.0	240.7	187.4	283.3	250.8	189.0
1957	204.7	177.7	249.1	191.7	292.4	259.7	192.2

TABLE VIII

SHARE OF GROSS DOMESTIC INVESTMENT IN G.N.P. AT CURRENT PRICES
(*percentage of G.N.P.*)

	Denmark (1)	Germany (F.R.)	Italy	Netherlands	Norway	Sweden	United Kingdom	
							Domestic	Foreign
1870–79	13.5		8.6			5.5	10.1	2.9
1880–89	11.7		11.7			6.5	8.9	3.9
1890–99	14.1		7.5			8.2	8.8	2.8
1900	15.4		13.3		12.3	11.2	12.9	1.7
1901	14.2		16.1		11.8	10.5	10.6	1.0
1902	15.6		11.8		11.5	10.6	11.4	0.8
1903	15.4		12.7		10.7	11.1	9.7	1.2
1904	15.1		12.7		11.6	12.1	10.6	1.2
1905	14.4		12.4		11.0	10.9	10.9	3.4
1906	16.9		13.2		12.2	10.8	10.8	4.9
1907	16.8		20.3		13.4	12.7	8.9	6.5
1908	15.0		16.9		13.3	11.3	3.7	6.0
1909	14.0		19.9		12.3	10.4	6.7	5.3
1910	13.4		14.3		13.0	11.2	7.0	6.6
1911	13.5		17.5		14.9	10.9	7.0	8.0
1912	13.8		17.1		15.4	10.4	8.0	8.1
1913	14.1		17.6		14.8	11.4	8.1	8.5
1920	9.1		14.2		23.4	13.6		
1921	10.4		9.7		16.9	11.1		
1922	10.7		13.4		14.1	9.2		
1923	10.9		17.1		14.0	11.4		
1924	11.4		19.2		13.1	11.8	9.2	1.7
1925	10.9	19.8	20.7		13.4	11.4	9.5	1.1
1926	10.5	12.7	18,2		12.4	11.8	8.8	−0.3
1927	10.2	22.6	15.0		11.7	11.6	12.0	1.9
1928	10.4	19.9	20.3		13.6	12.4	9.5	2.8
1929	11.8	13,9	19.0		14.1	12.7	9.7	2.3
1930	14.9	8.5	14.9		17.3	13.4	7.8	0.7
1931	14.7	2.0	14.0		13.7	14.3	7.0	−2.7
1932	11.7	4.6	14.3		12.2	12.1	8.0	−1.3
1933	13.0	10.9	13.5		12.2	11.0	10.3	—
1934	14.1	15.6	14.3		13.9	13.8	10.7	−0.2
1935	14.1		19.2		15.8	16.2	11.9	0.7
1936	13.5	18.7	16.6		16.5	16.5	13.3	−0.4
1937	13.7		19.6		18.9	18.7	13.8	−1.1
1938	12.0		17.3	11.2	18.9	18.9	11.3	−1.1
1948	14.6		18.2	25.9	30.7	18.8	13.1	0.4
1949	16.4		18.3	21.9	31.9	17.5	12.7	0.9
1950	16.7	22.8	19.0	26.3	28.1	17.8	11.2	2.4
1951	17.4	24.6	20.7	24.3	28.3	21.2	16.8	−2.5
1952	18.2	22.8	19.6	17.2	29.0	21.4	13.5	1.1
1953	18.2	21.4	19.5	20.0	29.2	19.0	14.6	0.7
1954	18.7	22.0	20.0	24.8	30.6	20.8	14.4	1.3
1955	17.1	25.7	21.6	23.3	30.2	22.0	16.2	−0.2
1956	16.8	24.2	21.5	26.2	29.8	21.2	16.2	1.5
1957	17.0	24.0	22.1	27.7	29.2	22.0	17.3	1.4

(1) Excluding inventories.

In fact, the figures do not always refer to G.N.P. but sometimes to Gross Domestic Product or to National Income. We have adjusted the series to make them as comparable as possible to the O.E.E.C. standardised system (1).

Denmark

Gross Domestic Product at factor cost: 1870-1938 figures from Kjeld Bjerke, "The National Product of Denmark 1870-1952", *Income and Wealth. Series V*. The link between Bjerke's figures for 1913 and 1920 has been made so as to eliminate the effect of the inclusion of North Schleswig, *i.e.* it was adjusted by the population ratio. 1938-57 figures from O.E.E.C. *General Statistical Bulletins*, July 1958 and January 1959.

Germany

Net National Product at factor cost for the years 1871-1938, from 1938 onwards gross national product at factor cost. The figures have been adjusted to eliminate the effect of changes in national territory, but the basic data for 1871, 1882 and 1891-1913 refer to pre-world-war I territory, linked to data for 1913, 1925-35 for post-world-war I territory (excluding Saar) linked to data for 1935-38 including the Saar linked to data from 1938 onwards for the Federal Republic, excluding Berlin.

Figures for 1871 and 1882 from Paul Jostock, "The Long-Term Growth of National Income in Germany", *Income and Wealth, Series V*, p. 102. Figures for 1891-1938 from Ferdinand Grünig "Die Anfänge der Volkswirtschaftlichen Gesamtrechnung in Deutschland", *Beiträge zur empirischen Konjunkturforschung*, p. 73, Duncker & Humblot, Berlin 1951. Figures for 1938 onwards from O.E.E.C. *General Statistical Bulletins*, July 1958 and January 1959.

Italy

Gross National Product at market prices.

1870-1956 figures from *Annali di Statistica*, Serie VIII, Vol. 9, Rome 1957, Istituto Centrale di Statistica. The original estimates have been increased to include those government goods and services which are treated in the Italian study as intermediate, in order to conform with the O.E.E.C. standardised system. The figures are adjusted to refer to the present Italian boundaries. 1957 figures from O.E.E.C. *Op. cit.*

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(1) *A Standardised System of National Accounts*, O.E.E.C., Paris, January 1959.

Netherlands

1900-1948 Net National Product at factor cost. 1948-1957 G.N.P. at market prices.

Figures for 1900-1938 from *Het Nationale Inkomen van Nederland 1921-39*, Centraal Bureau Voor de Statistiek (Utrecht 1948), and *Jaarcijfers voor Nederland 1947-1950*, Utrecht 1951, p. 215, for link 1938-1948. Figures for 1948 onwards from O.E.E.C. *Op. cit.* refer to G.N.P. at market prices, figures for national product at factor cost not being available.

Norway

Gross National Product at market prices.

Figures for 1900-1938 from *National Accounts, 1900-29*, No. XI, 143, Central Bureau of Statistics, Oslo 1953. The original estimates have been adjusted to eliminate repair and maintenance expenditures. The adjustment was a 30 per cent reduction of the original figures for gross investment. Figures for 1938 onwards from O.E.E.C., *Op. cit.*

Sweden

Gross Domestic Product at market prices.

Figures for 1870, 1880, 1890, 1900, 1910, 1923, 1929 and 1939 at constant prices are given in *Sveriges National Produkt 1861-1951*, p. 43, Konjunktur-institutet, Stockholm 1956. The Swedish figures include repair and maintenance, and we have eliminated this by reducing the constant price figures by the ratio of repair and maintenance to gross domestic product in current prices. Table 1, *Op. cit.* shows G.D.P. and gross capital formation in current prices, and repair and maintenance is assumed to be 30 per cent of the original figures for gross investment. For the years between these benchmarks, we used the movements shown by Svennilson's series for Swedish national income cited in *Growth and Stagnation in the European Economy*, E.C.E., Geneva, 1954, p. 233, which are also from the Konjunkturinstitutet. 1938-1957 figures from O.E.E.C. *Op. cit.*

U.K.

Gross National Product at market prices.

Figures for 1870-1938, James B. Jefferys and Dorothy Walters. "National Income and Expenditure of the U.K., 1870-1952", *Income & Wealth, Series V*. The link between 1913 and 1924 was made after an upward adjustment of 7·3 per cent to allow for exclusion of Southern Ireland after 1920. Investment

was deflated by the capital goods price index of Table XVI, *Op. cit.* pp. 39 and 40, and the rest of G.N.P. by the Consumer Goods and Services price index *Op. cit.* pp. 39 and 40. Figures for 1938-1957 from O.E.E.C. *Op. cit.*

Population

Mid-year estimates.

Denmark

K. Bjerke *Op. cit.* 1870-1951. Corrected to exclude the effect of the incorporation of North Schleswig in 1920 which added 5.8 per cent to population. 1952-1957 figures from O.E.E.C. *General Statistical Bulletins.*

Germany

1870-1913 *Statistisches Jahrbuch für die Bundesrepublik Deutschland,* 1956, p. 30. 1913-1938 Svennilson *Op. cit.*, p. 236. 1938-57 figures from O.E.E.C. *Op. cit.*

Italy

1870-1956 *Annali di Statistica, Op. cit.* Table 37, pp. 251-252. Figures refer to resident population in present boundaries. 1957 figures O.E.E.C. *Op. cit.*

Netherlands

1900-1938 Svennilson *Op. cit.* p. 236. 1938-1957 O.E.E.C. *Op. cit.*

Norway

1900-1938 Svennilson *Op. cit.* p. 236. 1938-1957 O.E.E.C. *Op. cit.*

Sweden

1870, *Le Vieillissement des Populations et ses Conséquences Economiques et Sociales,* U.N. 1956. 1880-1938 Svennilson, *Op. cit.* p. 236. 1938-57 O.E.E.C. *Op. cit.*

U.K.

82nd Statistical Abstract for the U.K. 1938, pp. 4 and 5, gives decennial (April) figures for the census years and for mid-years for 1913 and 1924-1937. Our index for 1870-1913 is based on interpolation of the census figures adjusted to a mid-year basis. The link between 1913 and 1924 is made after excluding the effect of the loss of Southern Ireland. 1938-1957 derived from the *1958 Annual Abstract of Statistics.*

Population of Working Age (*i.e.* aged 15-64)

Mid-year estimates.

For all countries, except the U.K., the basic source was *Le Vieillissement des Populations et ses Conséquences Economiques et Sociales*, United Nations, New York, 1956, which gives percentages of the population aged 15-64 for Census years. For inter-censal years, these percentages were interpolated. The percentages were then applied to our figures for total population. The publication cited does not give figures for the U.K. but only for Great Britain. We therefore derived the percentages for the U.K. for census years as given in the *82nd Statistical Abstract*, and the *1958 Annual Abstract*, interpolated the inter-censal percentages, and applied these to our population figures. For years later than the last census, *i.e.* from 1950, for most countries the ratios of the population aged 15-64 to total population were derived from the O.E.E.C. *Op. cit.*, and applied to our population figures.

Labour Force

Labour force activity rates (ratio of occupied population of all ages to population aged 15-64) derived from the census were applied to our estimates of the population of working age. For non-census years the activity rates were interpolated and applied to the figures for population of working age. For most countries O.E.E.C. estimates of the labour force are available from 1950 onwards, and these have been linked to the last available census figures. In some cases, however, the O.E.E.C. labour force activity rates do not coincide with the activity rates shown by the census, and we have therefore taken the O.E.E.C. figures only as an indication of *movements* in the activity rates since 1950 in most cases, and not as an indication of the activity rate itself. The activity rates derived from the censuses are given below after the year to which they refer.

Denmark

Activity rates derived from *International Statistical Yearbook, 1927*, League of Nations, for 1911 74.7%, 1921 67.3%, from I.L.O. *Yearbook 1938* for 1930 68.6%, from I.L.O. *Yearbook 1945-46* for 1940 76.3%, from I.L.O. *Yearbook 1957* for 1950 74.5%. Movement from 1950 to 1955 from O.E.E.C. *8th Annual Report*, Vol. II, p. 18, extrapolated to 1957.

These figures differ substantially from the adjusted estimates given by Bjerke *Op. cit.*, p. 151, which imply much higher but steadier activity rates, 1911 82.6%, 1921 81.1%, 1930 81.4%, 1940 80.9%, 1950 77.2%.

Germany

Activity rates derived from *Statistisches Handbuch von Deutschland 1928-1944*, p. 31 1949, München, 1907 74.5%, 1925 75.2%, 1933 71.7%, 1939 74.8%, from *Statistisches Jahrbuch für Bundesrepublik Deutschland, 1956*, p. 111, for 1950 68.9%. From 1950 onwards, the estimates of the O.E.E.C. *General Statistical Bulletins* were linked to the census figures. The adjusted rates derivable from Long *Op. cit.* are steadier, 1907 71.9%, 1925 72.3%, 1933 71.2%, 1939 72.7%.

Italy

Activity rates derived from *Annuario Statistico Italiano*, 1955, p. 377, for 1901 82.0%, 1911 79.7%, 1921 78.0%, 1931 71.9%, 1936 70.8%, 1951 63.6%. Movement from 1950 to 1955 from O.E.E.C. *8th Annual Report*, Vol. II, p. 18, 1956 and 1957 O.E.E.C. *General Statistical Bulletins*.

Netherlands

Activity rates derived from *International Statistical Yearbook 1927*, League of Nations, for 1909 65.2%, and 1920 64.5%, from *Statistical Yearbook of the Netherlands 1953-54*, for 1930 63.4%, and 1947 63.2%, for 1950 onwards the figures in O.E.E.C. *Op. cit.* were linked to the census figures.

Norway

Activity rates derived from *Statistisk Arbok 1957*, p. 20, for 1900 69.1%, 1920, 66.9%, 1930 65.4%, 1950 64.2%. From 1950 onwards the movements shown in the O.E.E.C. *General Statistical Bulletins* were used, although the 1950 figure in this latter source shows an activity rate of 67.1% for 1950 compared with the lower census figure of 64.2%.

Sweden

Activity rates derived from *International Statistical Yearbook, 1927*, League of Nations, for 1910 66.5%, 1920 74.4%, from I.L.O. *Yearbook 1938* for 1930 71.4%, from *Statistisk Arsbok 1957*, p. 29, for 1940, 67.1%, and 1950 66.5%. Movement from 1950 to 1955 O.E.E.C. *8th Annual Report*, Vol. II, p. 18, extrapolated to 1957.

U.K.

Activity rates derived from *82nd Statistical Abstract for the U.K.*, p. XV, for 1881 72.8%, 1891 73.1%, 1901 70.3%, 1911 70.3%, 1921 68.5%, 1931 68.6%, from the *Statistical Abstract for 1958* for 1951 69.4%. Movements

from 1949 to 1957 derived from annual estimates for the labour force, *Op. cit.* pp. 106-7, although these figures show a slightly higher proportion of the population in the labour force in 1951 than does the census.

Unemployment as a Percentage of the Labour Force

The estimates have been derived from the Yearbooks of the I.L.O. for 1937, 1938, 1945/46, 1957 and 1958. The I.L.O. figures generally only cover a part of the labour force, and are presented both in absolute figures and as a percentage of the sample from which they are drawn. We have therefore subjected the I.L.O. figures to two adjustments: (a) the percentage rate of unemployment has been scaled down in those cases where the sample is drawn from a group, *i.e.* trade unionists, whose propensity to unemployment is likely to be higher than average for all employed persons. In all cases, the estimates were multiplied by .7 to effect this adjustment, for this was the ratio between the rate of unemployment as shown in unemployment insurance statistics and the rate shown by trade union unemployment statistics for Germany — where the two different sets of figures are available and can be compared for a fairly long run of years; for the U.K. where a similar comparison is possible there does not seem to be much difference between the rate shown by trade union and insurance statistics but we have assumed that the U.K. situation was less typical than the German; (b) the figures were then subjected to a second adjustment to allow for the fact that a certain proportion of the labour force is unlikely to be subject to unemployment at all, *i.e.* employers, independent proprietors and family workers. The unemployment rates are therefore scaled down by the ratio of the number of wage and salary earners to the total labour force as given in the census (figures are given in I.L.O. Yearbooks). In the case of the post-war figures for Germany and the U.K., the sample covered by the unemployment data is greater than the number of wage and salary earners, so that the unemployment figure is adjusted by the ratio of the sample to the total labour force.

A valuable source of information for trade union unemployment statistics is to be found in "International Comparison of Unemployment Rates", by W. Galenson and A. Zellner, published in *The Measurement and Behaviour of Unemployment*, N.B.E.R., 1957, which also contains a useful analysis of the value of these statistics. For the years before 1927, we used this source for all countries. For the following years, the I.L.O. figures are available, and in the country source notes below, the figures in brackets refer to the type of I.L.O. statistics which we have used. For Italy we have not thought it worthwhile to estimate unemployment as the pre-war figures are of more dubious value than those for other countries.

Denmark

1903-1957 Trade Union Statistics (III) multiplied by .7 for adjustment (a), and by .73 for adjustment (b); total adjustment factor .511.

Germany

1903-1926 Trade Union Statistics multiplied by .7 for adjustment (a), and by .7 for adjustment (b); total adjustment factor .49. 1927-1938 unemployment insurance statistics (V), adjustment (b) .7, 1948 onwards unemployment insurance statistics (V) adjustment (b) modified, *i.e.* ratio of sample to total .744.

Netherlands

1911-1938 Trade Union Statistics (II) of percentage of days lost per month by unemployment, multiplied by .7 for adjustment (a) and by .79 for adjustment (b); total adjustment factor .553. 1948 onwards unemployment insurance statistics (VB) adjustment (b) .79.

Norway

1904-1938 Trade union statistics (III) multiplied by .7 for adjustment (a) and by .72 for adjustment (b); total adjustment factor .504. 1948 onwards unemployment insurance statistics (VB) adjustment (b) .72.

Sweden

1911-1955 Trade union statistics (IV) multiplied by .7 for adjustment (a) and by .7 for adjustment (b); total adjustment factor .49. 1956 onwards unemployment insurance statistics (V) adjustment (b) .70.

United Kingdom

1900-1913 Trade union statistics multiplied by .74 for adjustment (b); 1920-38 Unemployment insurance statistics adjustment (b) .74. 1948 onwards unemployment insurance statistics (VB), adjustment (b) modified, *i.e.* ratio of sample to total .933.

Annual Hours Worked Per Head

Figures on annual hours worked per head are the product of separate estimates of changes in weekly working hours, and of holidays.

Weekly Working Hours

For early years the available figures on working hours are mostly based on guesses by writers on social conditions, or on small samples made by

such writers. A number of these writers are cited by Colin Clark in *Conditions of Economic Progress*, e.g. on p. 135 he cites a figure of 66 hours per week for Germany in 1885 from Jeans *England's Supremacy*, on p. 159 a figure of 76 hours per week for Italy in 1885 from the same source, on p. 146 a figure of 55 hours per week for the U.K. in 1886 from Giffen, who thought hours had been 66 hours per week fifty years earlier. Because of the uncertainty surrounding these figures, we have assumed that the movement in working hours from 1870 to 1913 was the same in all our countries. This is probably a reasonable assumption, for in the period for which our information is better, *i.e.* from 1929 to 1957, the long-run movements in our countries have been rather similar. For 1870 we have assumed that working hours were 66 per week, and for 1913, 53.8 per week. The latter figure is derived from the extensive *Hours & Earnings Inquiry* (published 1909-1913) carried out by the Board of Trade in the U.K. The figure refers to weekly hours in manufacturing (exclusive of mealtimes and overtime) in September 1906. For the Netherlands and Norway, the figure for 1900 is simply an interpolation of the 1870-1913 movement.

Denmark

1913 onwards Bjerke. *Op. cit.*, page 128.

Germany

1929 (including building) and 1938 (excluding building) figures from I.L.O. Yearbook 1945-46. 1950 onwards *Wirtschaft und Statistik, Wochenbericht*, includes building and mining.

Italy

1929 and 1938 I.L.O. Yearbook 1945-46, p. 86, mid-point of range cited. Excludes building. 1950 onwards I.L.O. Yearbook 1958, figures for daily hours multiplied by 5.5.

Netherlands

For 1929 no figures were available so the average hours for countries with data were used. 1938 and 1950 onwards I.L.O. Yearbook 1958. However, the post-war figures are for adult males and they have been reduced in the ratio of adult male to total working hours which prevailed in 1938.

Norway

1929 as for Netherlands. 1938 and 1955 from I.L.O. Yearbook 1958, movement from 1955-57 as for U.K.

Sweden

Average of Denmark and Norway.

U.K.

1913 figure as cited above. 1929 is an average of the figure for 1924 (October) and 1935 (October) from Board of Trade inquiries. 1938 I.L.O. *Yearbook*. 1950 onwards October figures for manufacturing from *Ministry of Labour Gazette*, September 1958.

Holidays

There is very little historical information available on holidays except for the U.K. In 1906 the average number of holidays in British manufacturing was 11.2 days, including public holidays (cf. Board of Trade inquiry cited above); in 1948 it was about 15 days and in 1957 about 18 days. For recent years, *Etudes et Conjoncture*, I.N.S.E.E., Paris, 8th August 1957, page 863, provides a guide to the situation in most European countries which was as follows for 1957: Denmark 28 days (annual vacation 18, public holidays 10), Germany 22 days (12 plus 10), Italy 28 days (12 plus 16), Netherlands 18 days (12 plus 6), Norway 28 days (18 plus 10), Sweden 29 days (18 plus 11), U.K. 18 days (12 plus 6). It has been assumed that in 1913 workers had one week's vacation plus the same number of public holidays as in 1957. This fits in well with what we know of the U.K. It was assumed that a quarter of the increase in annual vacations was obtained from 1913 to 1929, another quarter from 1929 to 1938, no change from 1938 to 1950, and another half of the increase from 1950 to 1957.

G.N.P. per Man Hour

This table is derived from our other tables. G.N.P. is divided by total labour input. Total labour input is employment (labour force adjusted for unemployment) multiplied by the index of annual hours worked per head. In the case of Italy, no adjustment was made for unemployment — because of lack of comparable data over time. For the years 1870-1913 we have assumed that unemployment was stable at the 1913 level; unemployment figures were not available for the nineteenth century for any country except the U.K. In fact, 1913 was a year of low unemployment by pre-1913 standards, and 1870 unemployment was probably higher in most cases, but it is unlikely to have been different enough to affect our productivity estimates significantly (in the U.K. 1870 unemployment was 2.7 per cent compared with a 1913 figure of 1.6 per cent). Table 6 in the text is derived from the Table VII. Table 7 in the text is derived in the same way as Table 6 except that we used the

index of population of working age instead of labour force — which is equivalent to assuming that the labour force activity rate has been constant over time. It was felt useful to present this alternative estimate as the changes in the labour force shown by successive censuses are dubious in some cases, *i.e.* Italy where the census records a rapid fall in the labour force over time which may, in turn, tend to overstate the productivity increase as shown by Table 6 of the text. In Denmark the activity rate for 1929 is probably too low and the rise in productivity from 1913 to 1929 is probably overstated in terms of Table 6 of the text. In Sweden the activity rate for 1929 is probably too high and the rise of productivity from 1913 to 1929 is probably understated in terms of Table 6 of the text.

Share of Gross Investment in G.N.P. at Current Prices

Denmark

1870-1938. Bjerke *Op. cit.* Gross domestic investment excluding inventories as a percentage of Gross Domestic Product at factor cost. Bjerke does not specify whether his estimates include inventories, but Kuznets states that they do not, when he cites Bjerke's article in *Capital Formation and Economic Growth*, N.B.E.R. 1955, p. 64. 1938 onwards from O.E.E.C. *General Statistical Bulletins*, January 1959. Gross Domestic Capital Formation excluding inventories at market prices as percentage of Gross Domestic Product at market prices.

Germany

1925-1934 figures from Grünig, *Op cit.* Gross capital formation including inventories as a percentage of G.N.P. at factor cost. 1936 and 1948 onwards. Gross Capital Formation at market prices including inventories as percentage of G.N.P. at market prices from O.E.E.C. *General Statistical Bulletins*, January 1959.

Italy

Gross capital formation including inventories as a percentage of G.N.P. at market prices. 1870-1938. *Annali di Statistica Op. cit.* 1938 onwards O.E.E.C. *Op. cit.*

Netherlands

Gross Domestic Capital Formation as a percentage of G.N.P. at current market prices. 1938 *Statistics of National Product and Expenditure, 1938, and 1947 to 1955*, O.E.E.C., Paris, 1957. 1948-1957, O.E.E.C. *Op. cit.*

Norway

11900-1938. Cf. note above for G.N.P. Gross capital formation including inventories and excluding repair and maintenance, as a percentage of G.N.P. at market prices. 1958 onwards O.E.E.C. *Op. cit.*

Sweden

1870-1938. Cf. note above for G.N.P. Gross capital formation excluding repair and maintenance and including inventories as percentage of Gross Domestic Product at market prices. 1938 onwards. Gross capital formation including inventories as percentage of Gross Domestic Product at market prices O.E.E.C. *Op. cit.*

U.K

1870-1938. Jefferys and Walters, *Op. cit.* Gross capital formation including inventories as a percentage of G.N.P. at factor cost. 1938 onwards. Gross Capital Formation including inventories as a percentage of G.N.P. at market prices O.E.E.C. *Op cit.* In the case of the U.K. we have also shown foreign investment as this was quite significant before 1913. Figures for 1870-1937 from Jefferys and Walters, *Op. cit.*, pp. 36 and 37; 1938 onwards from O.E.E.C. *Op. cit.*

Angus Maddison

Federal Reserve System Discount Policy: an Appraisal

There was a time after World War I when discount policy was pretty much the whole of the American quest, such as it was, for economic stability. Today, of course, we look much more to fiscal policy. And where we do look to monetary policy, we think not so much of the discount operation as official open-market operations — largely because the growth of the public debt has enhanced so the power and subtlety of the latter (1). Nevertheless, discount policy has had a place in the post-Accord shape of things. As a matter of fact, not long after the Accord the Federal Reserve System adopted as one of its aims the restoration of the discount mechanism to something of its former position; and since then the discount rate has been used actively as a weapon of credit control.

This decision and the subsequent use made of the discount mechanism have provoked a good bit of comment, both favorable and unfavorable. And inevitably the basic question of the proper role of discount policy has been raised again. Nor is this an unimportant issue. The post-war period has been marked by a renewed interest and confidence in classical monetary techniques; and it is not likely that the share of responsibility for economic stabilization now borne by the monetary authorities will lessen appreciably in the near future. Thus, even the person who is somewhat skeptical of the ability of classical measures alone to carry this rather considerable load has every reason for wanting monetary policy to be as effective as possible. This is the motivation for the present examination of current discount policy. In what follows, then, some

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(1) The classical reference on the significance of the growth of the public debt is R. V. Roosa, "Interest Rates and the Central Bank", *Money, Trade and Economic Growth* (New York, 1951).

of the more interesting points of view represented in the contemporary discussions will be outlined. And beyond this an attempt will be made to resolve the fundamental issue: whether or not the current policy is the best possible.

I. An Outline of Current Discount Policy

Our first experience with discounting subsequent to the Accord was not an altogether happy one. Member-bank indebtedness increased sharply; borrowings averaged roughly $ 1.1 billions for the period July 1952 through May 1953, whereas over the previous twelve months they averaged only about $ 36 billion (2). Moreover, this expansion of System credit was characterized by a considerable confusion. Just as in the 1920's, bankers and officials alike were unsure about how a request for credit was to be treated. (Was access to the discount window a right of membership, or was it to be granted subject to conditions laid down by the System?) So surprising and disconcerting were these developments that Federal Reserve officials took the first opportunity — the second half of 1953, when, because of the oncoming recession, demands on the discount facilities fell off — to re-examine their discount policy (3). And presumably the strategy of the past several years reflects the conclusions reached in this reappraisal (4).

Two aspects of current discount policy warrant special emphasis here. The first is the relationship between the discount rate and market-determined rates; and the second is the role played by non-price eligibility (or rationing) criteria in the regulation of member-bank borrowing.

Certainly one of the more interesting appearances of the period of credit restraint just past — roughly, from January 1955

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(2) The reason most often cited for this rise in indebtedness is the tax incentive provided by the excess-profits tax which was on the books until the end of 1953. But it must also be remembered that until shortly before mid-1952 banks were operating in a world of pegged interest rates, and so were perhaps paying only casual attention to their secondary reserve positions.

(3) That such a study was being undertaken was first announced by the Board of Governors in its *40th Annual Report* (which covers operations for the calendar year 1953).

(4) This of course is only a conjecture, for the results (as such) of this study were never made public. But the latest statement of the Board of Governors' position — its *44th Annual Report* — reads as if this is a correct surmise.

through August 1957 — is the frequency with which the monetary authority adjusted the discount rate. True, it was increased ¼ percent to a level of 2 percent in January 1953; and with the return to easy money, it was reduced in two stages (February and April 1954) to a level of 1½ percent. But compare these with subsequent movements. In April 1955 the first of six upward adjustments of ¼ percent was made, and by August 1956 the discount rate stood at 3 percent. In August 1957 there followed still another increase, this time of ½ percent. Then, when economic conditions changed, four downward revisions were made, so that by April 1958 the official borrowing rate was again 1¾ percent. Finally, in October 1958 the trend was again reversed when the rate was increased to 2 percent; and in November 1958 a level of 2½ percent was established (5).

This contrast in the administration of the discount rate between the last three or so years and the first years after the Accord indicates clearly a movement in the direction of a more aggressive rate policy — an increased willingness to vary the official borrowing rate so as to keep it above, or at least not far below, the Treasury bill rate (6). And undoubtedly this is the pattern of the future.

But however interesting and important this development may be, too much should not be made of it. The point is that the System has still not gone so far as to establish a true penalty borrowing rate. Even during 1955 and 1956, for example, the discount rate was on occasion below the Treasury bill rate, with the result that member-banks were presented with an opportunity to « borrow for profit » (7). And this is not the whole picture. The maintenance

(5) The rate pattern cited here is that of the Federal Reserve Bank of New York. It should perhaps be noted in passing that occasionally (*e.g.*, in April 1956, and August-September 1958) all twelve banks do not keep together on their discount rates. Within the present context, however, differences in the timing and magnitude of the rate changes are not important and consequently can be ignored.

(6) As the graph in the Appendix shows, changes in the bill rate were much more promptly and fully matched in the period after January 1955 than previously. Also, a rather striking confirmation of this trend to a more aggressive rate policy is to be found in the fact that in August and September 1957 several of the Reserve Banks raised their discount rates ¼ percent, and at a time when the general economic outlook was far from clear.

(7) Since Treasury bills are now widely used by commercial banks to adjust their reserve positions, the relationship between the bill and discount rates is currently more important than that between the commercial paper and discount rates. Thus, if the bill rate exceeds the discount rate, member-banks will have an incentive to acquire borrowed reserves. And, when this spread is reversed, those with bills in their portfolios will prefer (out of profit considerations alone) to run down these holdings rather than go to the discount window.

of a penalty rate calls for more than simply keeping the official rate only slightly above the bill rate (which is the most that can be said for the Federal Reserve's policy). For one thing, banks with bills in their portfolios may nevertheless be willing to pay a modest premium for borrowed reserves in order to hold onto their money-market assets as a hedge against a tighter discount policy later on (8). Moreover, as the law governing discount operations now stands, Reserve Banks can make advances to a member-bank on the latter's own promissory note if the note is secured by marketable obligations of the federal government; and there is no restriction on the maturity of the pledged assets (9). Hence, a member-bank may well find itself in the position, when out of Treasury bills, of being able to borrow against collateral paying a return higher than the rate charged by its Reserve Bank.

Now, obviously, these remarks are not meant to suggest that member-banks seize every opportunity to borrow for profit. Whether or not they do depends, among other things, on how they feel about being in debt to the System; and this, as will be seen presently, is a point of considerable controversy. For the moment, however, it is enough to recognize that banks holding few or no bills — which perhaps is not an unusual situation when a policy of credit restraint has been in force for a while — are typically in a position to borrow for profit; and even banks holding bills are on occasion also in a position to do so.

That the discount rate is not now a penalty rate in the sense of, say, the British Bank Rate is hardly cause for surprise. It never has been. Nor has there ever, except perhaps towards the end of World War I, been much feeling for taking the big step (10). Often it is suggested that a penalty rate, while no doubt well suited to British institutional arrangements, is an administrative impossibility in the United States (11). There seems, however, to be little

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(8) The assumption is that System credits need not be rationed by price alone.

(9) For a complete statement of the rules governing Federal Reserve discount operations, see Regulation A (Revised) of the Board of Governors of the Federal Reserve System: Advances and Discounts by Federal Reserve Banks.

(10) On this and the other historical points made here, see S. E. Harris, *Twenty Years of Federal Reserve Policy* (Cambridge, 1939), Part I; see also L. V. Chandler, *Benjamin Strong* (Washington, 1958).

(11) See, for example, W. L. Smith, "The Discount Rate as a Credit-Control Weapon", *Journal of Political Economy*, April 1958, p. 171n. "In the United States", Smith writes,

substance to this argument (12). Indeed, it would appear more probable that the explanation for the resistance to the idea of a penalty rate lies more in political or policy, rather than technical, considerations. In the early days of the System, regional bank officials in particular were dominated by a commercial banker's mentality, and so tended to think of showing a profit on their operations and of competitive, not penalty, borrowing rates. They also conceived of their banks as primarily serving the banking community rather than the public good. All along, as a matter of fact, although the other nonsense has been pretty much put aside, the monetary authorities have continued to show themselves sensitive to the « needs of commerce, industry and agriculture ». And instead of a penalty rate, there developed the idea that commercial bankers are reluctant to be in debt to the System — that while they might borrow to cover a sudden loss of deposits, they would never borrow for a profit.

Now there certainly would seem to be an element of convenience in this view; but right or wrong, it has served for a long time as a justification for not instituting a penalty discount rate. Only recently have System spokesmen backed off even slightly from the extreme position held during the years before World War II. This, one gathers, is what lies behind the revision of Regulation A — covering discounts and advances by Reserve Banks — which was announced in 1955 (13). The revision was apparently intended to make unmistakably clear that the System regards access to its discount facilities as a privilege, not a right; or put differently, it emphasized the fact that more than ability to pay could be required of member-banks wanting borrowed reserves. Thus, an application for discount credit might be turned down by a Reserve Bank because the applying bank wants to borrow for the « wrong » reason, or

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" a penalty rate is impracticable because there are several thousand member banks able to borrow directly from the Federal Reserve and invest their funds in a broad range of assets carrying widely varying interest rates ".

(12) Why is it not possible to approximate the intent of the British Bank Rate *qua* penalty rate by simply setting up a formula which takes into account the situation of the particular bank applying for borrowed reserves? Thus, for example, if the bank in question holds Treasury certificates but no bills, and if the certificate rate is above the bill rate, then it should be made to pay a rate on borrowed reserves in excess, not just of the bill rate, but also the certificate rate.

(13) The most important part of this Regulation, the introduction or statement of General Principles, can be found in the January 1955 issue of the *Federal Reserve Bulletin*.

because the bank in question has borrowed too frequently in the past, or because the condition of its loan and investment portfolio is not all that the authorities would like. In any event, the publicity given these non-price eligibility conditions can be intepreted as evidence of a waning faith in the supposed traditional reluctance of member-banks to be in debt to the Federal Reserve.

It is clear then that, potentially at least, discount policy has two distinct aspects; it may involve price and non-price rationing (14). And it is also clear that the non-penalty character of the discount rate need not be significant. That is, if the authorities so choose, they can regulate the level of member-bank indebtedness without reference to the discount rate. Where the supposed traditional reluctance of member-banks weakens in the face of increasingly profitable opportunities, non-price eligibility conditions can (conceivably) be put in the way of the unwanted expansion of System credit.

II. The Official View on Discount Policy

Looking at the record of member-bank borrowing, one is struck with the apparent perversity of discount policy (15). Moreover, there is a sense in which this perversity is perhaps other than appearance. But as Federal Reserve theoreticians would quickly point out, critics of present-day discount policy who argue simply from the fact that average indebtedness increases in periods of credit restraint and decreases in periods of credit ease are largely wide of the mark. They forget that the System has another arm, its Open-Market Committee, which can be used to counter-balance changes in the level of member-bank borrowing. And they forget, or refuse to acknowledge, another tenet of the official doctrine: that borrowed reserves are not truly an offset to reserves lost through, say, open-market operations because by choice they are only a very temporary stop-gap. According to the so-called « need » theory of discounting, member-banks may borrow when faced with a sudden loss of deposits or, when already fully loaned up, with

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(14 The word " potentially " should be emphasized, for, as will be clear from what follows, the System does not make much use of its non-price eligibility conditions.

(15) A quarterly time-series of member-bank average indebtedness is given in the Appendix.

a loan request from a customer of long-standing; yet they will never turn to the discount window just to exploit a profitable differential between the lending and borrowing rates confronting them. Furthermore, their (supposed) reluctance to go into debt to the System will push them to reduce their borrowings as soon as is humanly possible. Thus, not only is it wrong in the official view to look at the level of borrowed reserves without paying attention to open-market activities, it is also wrong to think that the reserve position of member-banks (and hence the over-all credit situation) is unaffected by the ratio of borrowed to required reserves (16). The discount window may serve to ease the shock of official open-market activities, but it is not therefore a means of permanent escape.

The other important aspect of the monetary authorities' version of discount policy concerns the impact of changes in the discount rate on the expectations of the private sector of the economy. Interestingly enough, this « announcement effect » as it is sometimes called is presented as an asymmetrical influence on behavior. Lenders — in particular, commercial banks — are held to interpret an increase in the System's borrowing rate as a sure sign that tighter credit conditions lie just ahead, and are thus prompted to adopt a more conservative lending policy before such a course is actually forced upon them. Borrowers on the other hand are alleged to take the increase a signalling the end of good times, and as a result move to cut back their spending plans and pare down their loan demands. From both sides of the market, then, the responses are apparently stabilizing (17).

III. Alternatives to Current Policy: Rationale and Strategy

The foregoing interpretation of discount policy, though stoutly defended by Federal Reserve spokesmen, does not appear snug and sound to everyone. Recently in fact — perhaps as a corollary to the greater emphasis being put on discount operations — it

(16) It is this view which motivates the use of the concept " free reserves " (excess reserves minus borrowed reserves) as an index of credit conditions. See " The Significance and Limitations of Free Reserves ", *Monthly Review* of the Federal Reserve Bank of New York, November 1958, pp. 162-7.

(17) A reduction in the discount rate is supposedly productive of exactly opposite responses.

has been seriously questioned. It is to these criticisms, and the implied modifications of current policy, that we now turn.

A. *The Need for Discount Facilities*: Implicit in the "need" theory of rediscounting is the assumption that the discount windows of the regional Reserve Banks are in some sense essential features of our institutional arrangements. For this reason, the claim that member-bank borrowings are not a permanent offset to other System activities is entirely too negative a way of defending the discount operation. It is perhaps more accurate to characterize the official position as arguing that the combination of discount and open-market operations is actually superior to the latter alone. This stronger statement hinges on the legitimacy of the "safety-valve" interpretation of the discount window, for which, in turn, there are a number of possible defenses (18).

The rules governing reserve balances which were imposed under the Federal Reserve Act are quite strict; the averaging period used in computing required reserves is short, and the penalty for failing to maintain adequate reserves is certainly not inconsequential (19). Thus, member-banks — working within a rigid fractional reserve framework, and dealing with volatile, unpredictable liabilities and loan demands — are faced with something of a problem (20). It is this problem which has given rise to the claim that a discount mechanism *qua* safety-valve is essential, and to defenses of this claim which involve considerations both of equity and of economic efficiency.

Imposing reserve requirements sets a limit on bank earnings. Moreover, when these requirements are rigidly applied, the matter does not end with this direct influence. Considering the alternatives

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(18) It is clear that this argument — which proceeds by establishing the need for discount facilities — is not by itself a strong defense of any particular discount policy. At the same time, though, it is also clear that the validity of the argument has a direct bearing on the problem of selecting the "best" discount policy.

(19) For banks located in cities having either a Reserve Bank or a Reserve Bank branch, required reserves are computed by taking a weekly average of deposit liabilities; a two week averaging period is used for all other banks. Member-banks are charged a rate equal to the current discount rate plus two percent on the cumulative reserve deficiency shown for the given computation period.

(20) The individual members of a unit banking system are especially vulnerable to deposit losses. For an analysis of the causes and significance of this, see E. C. Simmons, "The Monetary Mechanism Since the War", *Journal of Political Economy*, April 1950.

available to a member-bank faced with a reserve deficiency, it becomes apparent that they are of uneven reliability; in point of fact, a banker can really only count on his loan and investment portfolio and the discount window of his Reserve Bank. But even calling loans, quite aside from the implications for economic efficiency, is not generally feasible in the short run. And if we go back to the period before (say) 1940, we see that the possibility of quickly liquidating investments also largely disappears; except as provided by the Federal Reserve, secondary markets of sufficient size simply did not exist then. In the absence of a large stock of liquid assets, however, to merely quote current reserve requirements is to understate the impact on bank earnings. That is, if banks are to increase the probability of escaping penalty charges (moral and financial) for reserve deficiencies, they must hold excess cash — or be allowed free and easy access to a discount window. Thus, the discount mechanism has functioned historically not only to offset the direct impact of reserve requirements on bank earnings, but also as a defense against this further erosion of earning potential.

Of course, the discount mechanism has also served in the name of economic efficiency; this, if anything, has been its most cited rationale. In any earlier day, banks tried where possible to meet reserve drains by calling loans or correspondent balances, and where calls were impossible they reacted by refusing to consider new applications or requests for loan renewals. Yet such responses were clearly not optimum, even for the individual banks; at the macro-level, they created lasting difficulties in the form of liquidity panics. Here again, then, the discount mechanism has traditionally seemed to be an obvious answer.

This particular justification of rediscounting would seem, though, to pertain to an earlier era, that is, to the years before World War II. Just as with so many other aspects of monetary policy, the growth of the public debt — specifically, the growth in the stock of Treasury bills and certificates outstanding — appears to have made the difference (21). Commercial banks are now able to hold large quantities of liquid assets which can be used as a means of adjusting their reserve positions, as in fact they have been

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(21) Professor Simmons seems to have been the first to point this out. See his "Federal Reserve Discount Policy and Member-Bank Borrowing", *Journal of Business* of the University of Chicago, January 1952.

in recent years. From the viewpoint of the individual member-bank, doing away with the discount mechanism is therefore distinctly feasible. Admittedly, there remains the macro-economic problem; but those who stress the possibility of undue pressure on market rates or of disorganized markets underrate the potential contribution of open-market operations and the ability of institutional arrangements to grow under the push of profit incentives. One can reasonably doubt that closing down the discount facilities would lead to sharper fluctuations in yields than those we have experienced since the Accord. Banks short of reserves would be forced to sell or run off their short-term holdings. Those in an opposite situation, however, would have a strong incentive — much stronger, it should be noted, than they have today — to retain the Treasury obligations already in their porfolios, and perhaps to acquire more. With market fluctuations thus limited, the task left to official open-market operations would be that much easier. Still, System purchases could be used when necessary to relieve general selling pressure, thereby enabling individual banks to unload their securities quickly and at no great loss. The judicious use of repurchase agreements with dealers in government securities would also help solve the problem of getting funds to particular banks. And so would other activities designed to expand government securities dealers' scope of operations, although clearly the adjustment to a world without a discount mechanism would take time.

The increase in the stock of short-term federal obligations outstanding has not wholly solved the problem of bank earnings (outlined above). Bills and other short-dated securities do pay a positive, if relatively low, rate of return, so that secondary reserves now have a lower opportunity cost than formerly; but this improvement in the earnings situation may not be sufficient to warrant abandoning our present discount arrangements. It is nevertheless questionable that the solution to this problem should be sought in the discount mechanism. Discounting does have definite implications for economic stability, and in this day and age these implications must be accepted as primary. That is to say, the future of the discount operation must be decided on the basis of its meaning for stabilization — especially since other solutions for the earnings problem (eg., lowering reserve requirements, or lengthening the computation period) are readily available.

Nor should the separate stabilization functions served by the discount mechanism be confused. The mere suggestion that we abandon our discount facilities may raise the spectre of 19th century financial crises, so it is well to emphasize that this proposal is not meant to question the desirability of having the central bank stand ready against true liquidity panics. That such a development is higly unlikely today does not matter; adequate safeguards against the extreme risks and dangers involved, since they cost so little, are really mandatory. Again, however, this does not imply that our present discount facilities are therefore essential. Strictly *ad hoc* arrangements would undoubtedly serve just as well for this purpose (22).

That closing down the regional discount windows appears feasible is not to say that it is thus the thing to do. We have so far only established an alternative to current policy, and there are others, as will be seen presently. But, which alternative should be adopted can only be decided in the light of our fundamental goal, economic stability. So, besides outlining the remaining alternatives, there is still before us the task of assessing the potential contribution of each possibility to the stability of our economic system.

B. *Professors Simmons and Smith on Current Policy*: The element of discretion bulks large in present-day discount policy. It is discretionary in the traditional sense; changes in, say, the official borrowing rate come deliberately, not automatically. Furthermore, it is discretionary in another sense; that is, Reserve Banks are not bound by law to make advances to any member-bank just because the latter is willing and able to pay the going rate. The question is whether these liberties are good or bad. Certainly the authorities must think of them as desirable. Yet it is this discretionary freedom which has drawn the fire of critics of Federal Reserve discount policy.

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(22) Mr. BALOGH, in his paper "Dangers of the New Orthodoxy", *The Banker*, June 1956, has suggested that the Bank of England's present interpretation of the "lender of last resort" function is a misreading of the message of BAGEHOT's *Lombard Street*. Thus, he writes (p. 350): "Bagehot evolved his principle (the Bank as lender of last resort) in response to the failure of the Bank of England in the middle of the last century to stop liquidity panics by providing cash against sound security in case of need. This principle has no relevance to, and must not be used as an argument in favor of, the continuous use by the discount market of the Bank of England as a source of funds".

For example, Professor Simmons, commenting on the way in which the System allocates discount credits, has written that non-price rationing " ... seems poorly suited to serve as a monetary control in a market economy " (23). He objects not only to the use (or better, possible use) of non-price eligibility conditions, but also to the failure to impose a true penalty borrowing rate and the continuing reliance on the reluctance of member-banks to borrow from the System. These objections are apparently based in part on philosophical considerations. More important for present purposes, though, is the analysis of the contribution of current policy to the goal of economic stability. Simmons makes the point that the combination of allocative devices presently being used reflects too strongly the Federal Reserve's long-standing sensitivity to the " needs " of the borrowing public, and that they cannot therefore be counted to effectively control the level of member-bank indebtedness. In particular, he doubts that the alleged unwillingness of banks to go to the discount windows is nearly so widespread as the authorities imagine, and hence feels that there is no real assurance that requests for borrowed reserves will not be very numerous. There is thus, for Simmons, an obvious danger in not employing a penalty borrowing rate or some other means by which System credit could effectively be rationed.

This idea that discount policy is even now limited by the Federal Reserve's concern for the " needs of commerce, industry and agriculture " is in a way rather persuasive. It must be admitted, of course, that this sensitivity is today less pronounced than at any time in the past. And yet something of it remains. System spokesmen continually insist that borrowing is a privilege, true, but it appears in fact to be treated more as a right of membership — at least in all cases where abuse is not flagrant (24). Such an approach is risky, however, when combined with the use of a non-penalty discount rate. It is dangerous, that is, to rely so much on the attitude of member-banks toward borrowed

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(23) E. C. Simmons, " A Note on the Revival of Federal Reserve Discount Policy ", *Journal of Finance*, December 1956, p. 420.

(24) This is the only conclusion which can be drawn from observations of regional Reserve Bank behavior; in particular, one cannot help but notice the way these banks hesitate before deciding to put pressure on member-banks which abuse their borrowing privileges. As one member of the Federal Reserve's official family put it: " Any bank with a good record can be virtually certain that it will get a loan ".

reserves, especially when, because of their own traditions, the authorities are not in a position to move quickly in response to a change in this attitude. In fact, the only possible justification for taking such a risk is the fact that the System can perhaps still keep a hold on the over-all situation through its open-market operations. The issue therefore is whether or not there is some limit to the potential of the latter (25). In other words, can the System count on being able to make sufficient open-market sales — at a time, it should be noted, when the demand side of the market is likely to be weak — to offset an expansion of member-bank indebtedness, while at the same time honoring its commitment to prevent the development of disorganized markets (26)? Clearly, no one knows for sure; but this is not to say that the possibility of a negative reply can simply be assumed away. In any event, it is with this question in mind that some sense can be made of the criticisms of current policy which rest on the apparently perverse behavior of member-bank borrowings (see section II above).

Without being able to get inside the heads of Federal Reserve decision-makers, one can never be sure whether member-bank borrowing has ever gotten out of hand or whether actual developments have always been, so to speak, planned. It certainly seems that on occasion it has been the former, which is why Simmons would like to see some changes made. He does not advocate closing down the discount facilities; rather, he would prefer to move in the direction of establishing a true penalty rate — perhaps in part because of his feeling for what is appropriate in a market economy. But one would also have to grant that non-price rationing — while in principle no less effective than price rationing — is on occasion somewhat ambiguous in practice; inter-bank discrimination and unwanted expansions of System credit are therefore more likely. In a word, there is more room for human error. The non-discretionary approach should perhaps then be given a slight nod. But only a slight nod, even with regard to actual operations. For where, historically, excessive use has been made of Federal

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(25) On this point, see W. L. Smith and R. F. Mikesell, "The Effectiveness of Monetary Policy: The British Experience", *Journal of Political Economy*, February 1957, p. 35.

(26) It should perhaps be mentioned here that the fact that individual banks try to get out of debt as quickly as possible is not so important as System spokesmen try to make out. The relevant figure is aggregate indebtedness, and this shows signs of falling off only when conditions of credit ease return.

Reserve facilities, the fault has been official reluctance and hesitation and not the uncertainties, of non-price techniques. The latter have been talked about, but little used. We shall return presently to this possibility of a greater reliance on non-price eligibility criteria, but before doing so some attention must be given to Professor Smith's critique of current policy.

In contrast to Professor Simmons, who is interested in the question of the appropriate level of the discount rate, Professor Smith is primarily concerned with the problem of rate administration (27). His thesis, in capsule form, is that changes in the discount rate, as carried out under the present policy, are if anything destabilizing in their effect. And this, as he sees it, is because these changes are made at the discretion of Federal Reserve officials.

Smith is inclined (and rightly, it would seem) to play down the influence of changes in the discount rate on businessmen's expectations. But he would also contend that where, say, rate increases do have an effect, they promote instability, not stability — the idea being that businessmen take such changes as grounds for optimism about the future. An even more important cause of instability, however, is the impact of rate increases on the expectations of market professionals. Traders and dealers, it is argued, pay close attention to the activities of the central bank, and use their resulting interpretations as a basis for forecasting the future. Because of this, the way is opened to possible misinterpretations of official intentions; and because traders and dealers play such an important role in securities markets, the way is also opened to unwanted, perverse fluctuations in market yields. For example, an increase in the discount rate which the authorities regard as " ...merely a technical adjustment to preserve or re-establish a normal relation to other interest rates may be interpreted as a sign of a marked tightening of monetary policy and cause a sharp rise in long-term rates ". Or the failure to make such an adjustment " ...may create the expectation of a turnabout in monetary policy and cause a decline in long-term rates " (28). Now such developments, when they come to pass, are unfortunate because they tend to undermine overall monetary control. A sudden decrease in market yields, particularly if it follows a protracted increase, may as Smith points out bring

(27) " The Discount Rate as a Credit-Control Weapon ", *op. cit.*
(28) *Ibid.*, p. 175.

forth a flood of capital issues heretofore held off the market; and, more importantly, a sudden increase in rates may force the authorities to relent in their (restrictive) open-market activities.

To remove once and for all the root cause of such difficulties, that is, the discretionary rate policy, Smith would have the Federal Reserve follow the lead of the Bank of Canada. The discount rate would then be tied directly to the Treasury bill rate by means of a well-publicized formula which would have built into it an appropriate yield differential (29). Thus, the official borrowing rate would vary only as the bill rate varied, so that there would be no room for interpretation, let alone misinterpretation. Quite simply, there would be nothing to interpret. The authorities could then feel free to press a restrictive monetary policy without having to worry about perverse yield movements arising out of their attempts to keep the official lending rate in line with market rates.

On *a priori* grounds alone there is no reason to suppose that Smith's "announcement effects" are any less plausible than those outlined in section II above (30). Moreover, his interpretation of post-Accord developments is quite convincing (31). It must be remembered, however, that while something is perhaps to be gained from following the course he advocates, something may also be lost. Market professionals do pay careful attention to what the Federal Reserve does, but this does not mean that expectational effects will necessarily be perverse. The point is that System policymakers have in the open-market trading desk an excellent information source, and so, ideally, are in a position to either confirm or confound the expectations of the market (32). Confounding expectations may be a good idea; it all depends on what the authorities want to accomplish. But in adopting the non-discretionary approach,

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(29) For details of the Bank of Canada's procedure and a statement of the reasons for its adoption, see the *Annual Report of the Governor of the Ministry of Finance*, 1956, pp. 45-6. This technique, as applied in the United States, would come out something as follows: each week the Federal Reserve would announce a discount rate computed from the average of the closing bill rates for the previous week or from the average bill rate established at the last bill auction.

(30) This reverse-twist was first presented by SAMUELSON in his paper, "Recent American Monetary Controversy", *Three Banks Review*, March 1956, p. 10n.

(31) *Op. cit.*; see especially notes 16-18, 20.

(32) To confirm market expectations is simply to do what is expected, and so minimize the reaction to the change in the discount rate. To confound expectations is to deliberately (or otherwise) set off a sharp reaction by doing the unexpected.

it is just this freedom to confound the market that is given up. Much depends therefore on one's estimate as to the likelihood that the practical difficulties outlined by Smith can be overcome within a discretionary framework.

C. *In Defense of Discretion*: Different as they are in important respects, the arguments and proposals of Professors Simmons and Smith can nevertheless be taken — without doing a serious injustice to either author — as comprising a single point of view. And in addition to a thorough critique of the discretionary elements in present-day policy, there emerges from this union an integrated proposal for a non-discretionary approach to the discount operation which can be put alongside our first major alternative to current policy (that of closing down the discount facilities). Of course, the feasibility of this second alternative depends entirley on the degree to which the discount rate is made to approximate an effective penalty rate. That a rather considerable differential between, say, the Treasury bill and discount rates would be required under the Simmons-Smith proposal follows from the fact that it would turn the central bank into a true " lender of last resort ". Member-banks, simply by paying the going rate, would be able to get borrowed reserves; only their profit calculations could limit their acquisitions. Clearly, then, if bank indebtedness were to be kept to a level which could be offset by open market operations, the rate spread would have to be larger than anything we have so far known. Indeed it might even be necessary to make provision for periodic adjustments in the rate differential, although this would be difficult to manage in a wholly non-discretionary way. Faced with a non-discretionary discount policy, member-banks would have no need to husband their secondary reserves against the possibility of (for example) a tightening of non-price eligibility conditions, and so would be tempted to run through their bill holdings quickly; but having done this, they might then find that the discount rate, when judged in terms of the assets still in their port-folios, was no longer a penalty rate (33).

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(33) Although Smith does not make this point explicitly, he does seem to be well aware of it (*op. cit.*, p. 176n).

The establishment of a penalty borrowing rate could reasonably be expected to bring cries of pain from bankers and politicians alike. Presumably, however, cries would be no louder than those which would result if the discount facilities were closed once and for all; for given a true penalty rate in the Simmons-Smith scheme there is not much difference between the two alternatives. Admittedly, even with a penalty rate banks could, under the Simmons-Smith approach, borrow when faced with "last minute" reserve deficiencies; nor would the imposition of a relatively high borrowing rate stop-up completely the safety-valve which the authorities appear to value so highly (34). Yet these are precisely the features of present-day policy which (when considered in section III. A. above) were judged as being appropriate only to pre-war circumstances, or as fulfilling needs which were realistic only in a previous era, and so too much should not be made of them. It is more to the point to recognize that both alternatives would force member-banks to meet pressures on their reserve positions by selling from their investment portfolios; thus, more quickly than under the present arrangements, the banks would find that they would have to go to their long-term assets if they wanted to continue to expand their loan portfolios or if open-market operations kept them continually with their backs to the wall. Now if the Federal Reserve dealt as a matter of course over the whole maturity range of government securities, this aspect of these alternatives might not loom so large. Where, however, because of the "bills only" doctrine, open-market dealings are confined to the short end of the maturity structure, it must be regarded as crucial.

The apparent inferiority of current policy is not, even on the above count, due to its discretionary character. As was pointed out previously, there is no basis for thinking that non-price rationing is in principle any less effective than price rationing in curbing unwanted expansions of System credit; again, what has been wanting in Federal Reserve policy is a lack of will. Yet, this sort of argument is entirely too negative a defense of the use of non-price rationing techniques. The discretionary approach to discounting can be better defended by emphasizing the flexibility of this kind of policy, that

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(34) For a sympathetic discussion of the need for "safety-valves", see L. S. Ritter, "Income Velocity and Anti-Inflationary Monetary Policy", which will appear in the March 1959 issue of the *American Economic Review*.

is, the power not only to control total indebtedness, but also to selectively control bank lending practices.

To point to the possibility of controlling the level (and perhaps even types) of bank loans is not to suggest that the control of the money supply is unimportant. It obviously is very important, more so than the control of any other single stock of assets. But at the same time it is not all-important, at least when inflation is the stabilization problem. The question at issue, then, is whether or not we should seek to control other asset stocks in addition to the money supply.

Commercial bank lending is a particularly important aspect of the total credit picture partly because it is closely associated with phenomena which have a special significance for the contemporary inflationary process — namely, inventory speculation and money wage increases. As a matter of business practice, the need which prompts a firm to seek outside financing helps determine the alternatives available. For example, if the contemplated expenditure is long-lived, a bank loan is a possible short-run substitute for open-market borrowing. But when funds are needed to finance an inventory buildup or an increase in transaction balances, a bank loan is more likely to be the only alternative available. Thus, to the extent that bank lending is held in check, employer resistance to employee demands for money way increases will probably be heightened. And where bank loans are not readily available firms will be less likely to speculate either in input requirements or their final outputs. Needless to add, both results would brighten the economic outlook.

In part, the effectiveness of an attempt to curb bank lending depends upon the extent of market imperfection — in particular, on the extent to which borrowers are able to shift between credit sources. If substitute sources are immediately available, it obviously does little good to limit access to bank loans. As was suggested above, however, firms are in some measure limited by their own conventions (35). And in addition it appears to be a fact of life that some borrowers simply have no alternatives beyond their local

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(35) This is not to suggest that borrowers are therefore irrational. Under certain conditions the desire to match the length of the loan with the duration of the investment makes a good deal of sense.

bank (36). There does then appear to be some imperfection present currently, though it may be less extensive than formerly.

It should be noted that the selective control of bank lending can be effective even when credit markets are relatively perfect, for there is still the matter of timing and the cumulative nature of inflation. Where borrowers do have feasible alternatives to bank loans, the forces of custom or tradition and cost considerations nevertheless suggest that they will be investigated and utilized only after a lapse of time. Even where the response is immediate, the actual process of securing the substitute financing consumes some time. Nor is this a trivial consideration. Inventory speculation, particularly in commodities like steel which as inputs have an economy-wide significance, provides the very force which gives rise to " premature " price adjustments; and these price increases tend to cumulate through the rest of the economy. Once prices have been pushed up, the monetary authorities find themselves in a rather delicate position; they either have to expose themselves to the charge of economic irresponsibility, of having forced a downturn in economic activity, or else increase the money supply to accomodate the new, higher level of prices. At the very least, then, the control of bank lending could serve to compensate for the operation lag in general monetary policy (37).

To make use of the discount mechanism to selectively control bank lending would first of all require the establishment of appropriate non-price eligibility conditions (for example, a maximum figure for the ratio of loans to total loans and investments). And it would be necessary to keep the discount rate below the penalty level (38). If banks are to avail themselves of the System's discount facilities and thereby submit to the regulation of their activiets, it must in some sense be profitable for them to do so. (It might therefore be a good idea to increase considerably the charge levied

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(36) In this connection, see R. F. KAHN, " Monetary Policy: A Symposium ", *Bulletin of the Oxford University Institute of Statistics*, April-May 1952; see also F. W. PAISH and R. F. G. ALFORD, " How Interest Rates Cut Spending ", *The Banker*, August 1956, pp. 478, 481-3.

(37) The operation lag is measured as the amount of time it takes for a particular monetary policy, once instituted, to become effective.

(38) The administrative technique advocated by Smith could still be used, but the rate spread would have to be smaller than he suggests. It is possible, however, that the discount rate would never have to be changed, in which case perverse announcement effects would be no problem.

against banks having reserve deficiencies; in general, any measure which would increase the " cost " of non-compliance with Federal Reserve eligibility requirements would be all to the good). Moreover, the authorities would probably have to use open-market operations more aggressively than they have in the past: specifically, it would have to be made clear to member-banks in advance that open-market operations would not be employed to ease seasonal pressures on their reserve positions; and the banks could not be allowed to build up their secondary reserves during cyclical downswings. This is not to say that the System could never follow anything but a tight-money policy, but only that the periodic easing of credit conditions would have to come in part from a relaxation of borrowing eligibility conditions.

Too much should not be expected from this sort of policy, since it in a sense self-defeating. The selective control of bank behavior by means of non-price eligibility conditions on borrowing, if it is to be meaningful, must be closing off profitable opportunities. Thus, as the authorities would seek to accomplish more and more by their discount policy, they would be making their discount windows less and less attractive; and beyond a certain limit the member-banks would doubtless prefer to ignore the various eligibility criteria and take their chances in the open market. Yet, a discount policy which makes an attempt at selectively controlling bank lending may nevertheless be worth the bother. With monetary policy having to bear more and more responsibility for economic stabilization, we are at the point where every increase in effectiveness, however small, should be considered well worth the effort involved.

IV. Conclusion

Professor Simmons, in his analysis of present-day discount policy, has pointedly maintained that the Federal Reserve has as its goal " ... much more than control of the size of the stock of money ". " Control of lending ", he feels, " is considered to be an equally if not more important objective " (39). And certainly the

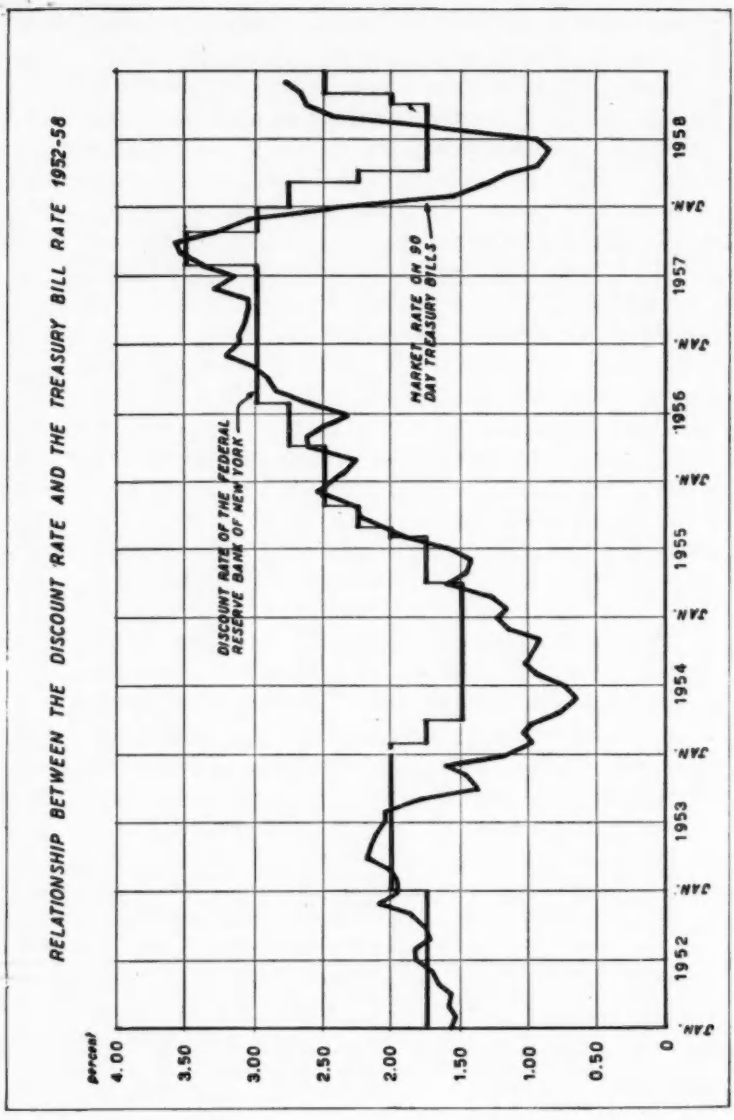
(39) " A Note... ", *op. cit.*, p. 417.

fact that System spokesmen have over and over again — in the light of the revised version Regulation A — reaffirmed as official doctrine the view that discounting is a privilege tends to confirm this interpretation of the aims of discount policy. Unfortunately, however, there is little in the Federal Reserve's actual behavior which would support Simmons' opinion. Its pronouncements notwithstanding, the regional Banks have throughout the post-Accord period continued to treat their discount facilities as a "line of credit" for their member-banks, and one is thus forced to conclude that all the talk about "right vs. privilege" has been pretty much intended only to reinforce the very reluctance which has always been attributed to commercial bankers. As a matter of fact, given the philosophy which seems to govern official thinking — and which is perhaps best characterized by the refusal of the Federal Reserve to take on even stand-by powers to control consumer credit — it would be something of a contradiction if the discount mechanism were looked upon as a means of selectively influencing bank behavior. And when it comes to the matter of direct or selective controls, the authorities are nothing if not consistent. Moreover, it does seem rather unlikely that this basic outlook, and hence current policy, will change in the near future.

In this instance, such a posture is to be regretted — particularly since the discretionary approach outlined above (section III. C.) appears to preserve the apparent advantages of present arrangements. Employing the discount mechanism to control bank lending is not inconsistent with its use either as a safety-valve or as a source of information about market conditions. But without a real desire to use the discount operation as a way of getting at bank lending practices — and this, it would seem, is precluded by their hostility to direct or selective control techniques — the authorities would be well advised to move in the direction of the Simmons-Smith proposal or of closing down the Reserve Bank discount windows altogether. The risks inherent in current policy would thereby be minimized, and without great loss; for, as the analysis of section III. A. indicates, the needs fulfilled by this policy are either no longer truly pressing or else can be better cared for in other ways.

Minneapolis JOHN H. KAREKEN

APPENDIX


RELATIONSHIP BETWEEN THE DISCOUNT RATE AND THE TREASURY BILL RATE 1952-58
percent
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0
JAN. 1952
JAN. 1953
JAN. 1954
JAN. 1955
JAN. 1956
JAN. 1957
JAN. 1958
DISCOUNT RATE OF THE FEDERAL RESERVE BANK OF NEW YORK
MARKET RATE ON 90 DAY TREASURY BILLS

MEMBER-BANK BORROWING, 1950 TO PRESENT

(in billions of dollars) •

	All Member-Banks	Central Reserve City Banks		All Reserve City Banks	All Country Banks
		New York	Chicago		
1950 I	.10	.04	.02	.03	.02
II	.08	.02	—	.04	.03
III	.13	.04	.01	.06	.03
IV	.12	.04	.01	.05	.03
1951 I	.26	.06	.02	.13	.05
II	.26	.08	.01	.10	.07
III	.27	.07	.01	.1	.05
IV	.37	.06	.02	.22	.06
1952 I	.30	.01	.06	.17	.05
II	.50	.11	.02	.28	.10
III	.93	.19	.05	.53	.16
IV	1.39	.27	.20	.73	.20
1953 I	1.29	.26	.30	.57	.16
II	.84	.12	.06	.45	.21
III	.51	.03	.06	.30	.13
IV	.43	.07	.03	.23	.11
1954 I	.19	.02	.03	.10	.06
II	.15	.01	.01	.07	.07
III	.09	.01	.01	.03	.04
IV	.16	.03	.01	.08	.04
1955 I	.38	.05	.08	.18	.08
II	.42	.01	.06	.22	.12
III	.71	.12	.07	.39	.13
IV	.91	.21	.10	.42	.13
1956 I	.87	.17	.15	.40	.14
II	.93	.10	.21	.48	.17
III	.81	.16	.07	.42	.15
IV	.72	.20	.12	.29	.11
1957 I	.63	.09	.12	.28	.14
II	.97	.23	.14	.43	.20
III	.97	.25	.06	.49	.17
IV	.77	.13	.11	.38	.16
1958 I	.28	.05	.02	.12	.09
II	.13	.01	—	.05	.07
III	.28	.06	—	.14	.08
IV	.55	.06	.07	.27	.15

• The figures given are quarterly averages of daily indebtedness.

JOHN H. KAREKEN

BANCA NAZIONALE DEL LAVORO

HEAD OFFICE: ROME

VIA VITTORIO VENETO, 119

Condensed Statement of Condition, December 31, 1958

ASSETS	(Million lire)	LIABILITIES	
Cash, Balances with Bank of Italy & Money at call	255,042.3	Capital	1,150.0
Treasury Bills	102,231.4	Ordinary Reserve Fund	11,660.0
Govt. or Govt.-guaranteed Securities	84,721.5	Staff Retirement Fund & Provident Fund	19,944.9
Other Securities	18,704.6	Deposit & Current Accounts	678,140.7
Bills discounted	219,094.8	Correspondents	99,423.2
Advances and Loans	260,740.8	Foreign currency accounts	45,942.5
Contangoes	13,995.2	Current accounts with Annexed Sections	4,348.4
Due from Correspondents	32,107.9	Circular cheques (*assegni circolari*)	25,519.7
Current accounts with Annexed Sections	3,129.8	Advances taken	18.9
Customers' liabilities for guarantees, Acceptances, etc.	117,873.7	Bills for collection	35,788.2
Miscellaneous accounts	4,870.4	Guarantees, Acceptances, etc.	117,873.7
Participations	—	Miscellaneous accounts	67,498.1
Premises, Furniture and Equipment	—	Unearned discount, etc.	4,139.6
		Net Profit	1,074.5
Total	1,112,512.4	*Total*	1,112,512.4
Securities deposited by third parties	329,647.5	Depositors of securities	329,647.5
Staff Retirement Fund & Provident Fund: Bank's securities deposited as guarentee	20,286.2	Bank's securities guaranteeing Staff Retirement Fund & Provident Fund	20,286.2
	1,462,446.1		1,462,446.1

AUTONOMOUS SECTIONS FOR SPECIAL CREDITS

SECTION FOR CREDIT TO MEDIUM AND MINOR INDUSTRIES

Capital, Reserves and Government Guarantee Fund L. 3,375,615,366

SECTION FOR HOTEL AND TOURIST CREDIT

Aggregate Capital and Reserves L. 4,622,892,821

SECTION FOR CO-OPERATIVE CREDIT

Capital and Reserves L. 2,770,923,619 - Government Guarantee L. 2,000,000,000

SECTION FOR MORTGAGE CREDIT

Aggregate Capital and Reserves L. 2,944,596,046

SECTION FOR CINEMA CREDIT

Aggregate Capital and Reserves L. 1,612,683,434

BANCA NAZIONALE DEL LAVORO

BRANCHES IN ITALY

ALGHERO
ANCONA
ASCOLI PICENO
AVELLINO
BARI
BENEVENTO
BERGAMO
BIELLA
BOLOGNA
BOLZANO
BRESCIA
BRUNICO
CAGLIARI
CARRARA
CASTEGGIO
CASTEL SAN GIOVANNI
CATANIA
CATTOLICA
CHIETI
CHIOGGIA
CIVITANOVA MARCHE
CIVITAVECCHIA
COMO
CORIGLIANO CALABRO
CORTEOLONA
COSENZA
CREMONA
CROTONE
CUNEO
EMPOLI
FABRIANO
FANO
FERMO
FERRARA
FIORENZUOLA D'ARDA
FIRENZE
FOGGIA
FOLIGNO
FORLÌ
FRATTAMAGGIORE
GENOVA
GENOVA - SAMPIERDARENA
GORIZIA
GROSSETO
IGLESIAS
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JESI
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L'AQUILA
LATINA CENTRO
LATINA SCALO
LECCE
LIVORNO
LUCCA
MACERATA
MANTOVA
MERANO
MESSINA
MILANO
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PALERMO
PARMA
PAVIA
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PESARO
PESCARA
PIACENZA
PORTO RECANATI
PORTO SAN GIORGIO
PORTO TORRES
PRATO
RAVENNA
REGGIO CALABRIA
REGGIO EMILIA
RICCIONE MARINA
RIMINI
ROMA
ROSARNO
SALERNO
SAN BENEDETTO DEL TRONTO
SASSARI
SAVONA
SCHIO
SENIGALLIA
SOTTOMARINA DI CHIOGGIA
STRADELLA
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